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CALIFORNIA

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ACADEMY

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OF

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SCIENCES

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1984-1985

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ANNUAL REPORT

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Natural History

Museum

& Aquarium



# CALIFORNIA ACADEMY OF SCIENCES

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Golden Gate Park, San Francisco, California 94118

*Executive Director:* Frank H. Talbot

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# MESSAGE FROM THE CHAIRMAN

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**Rudolph A. Peterson**

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THE 1984-85 FISCAL YEAR marks the Academy's one-hundred-and-thirty-second year of scientific and educational contributions to the Bay Area. The institution has grown in all areas of endeavor under the strong leadership of my colleagues on the Board of Trustees and with the able direction of Dr. Frank H. Talbot. It is my pleasure as chairman of the board to have this opportunity to thank the fine staff and more than 700 volunteers who work so hard to present the museum and aquarium's excellent and varied programming.

We were saddened during the year by the deaths of Trustees and longtime friends Mr. Decker G. McAlister and Mr. Brooks Walker, Sr., both of whom were highly dedicated participants in the running of our historic museum and aquarium. And we shared with all of San Francisco and the Bay Area in mourning the passing of Victor "Trader Vic" Bergeron in October 1984. Vic Bergeron was for decades a devoted friend and supporter of the museum.

This year has been one of consolidation and urgent preparation for a great step into the future: implementation of our long-range master plan. To help guide us through this exciting period of renewal and growth, we have appointed a new Advisory Council of twenty distinguished members (see list below). The purpose of this council is to enhance the image and broaden the visibility of the institution in the community, both locally and nationally. The Advisory Council will review, discuss, and react to current activities of the Trustees and staff and will provide advice and feedback on strategy and planning for future development.

Also within this year, we welcomed Mrs. William R. (Rosemary) Hewlett to the Board of Trustees and look forward to working with her during the years ahead. Dr. Bruce A. Bolt was reelected president. The involvement of the Academy's 300 fellows continued to expand, guided by the Fellows' Committee and its chairman, Dr. John S. Hensill. The second annual Fellows' Day featured a provocative symposium on the science and politics of water resources in California.

As a resource for the Board of Trustees, the new Advisory Council adds even greater vigor to an already vigorous and enthusiastic group of supporters. Indeed, the strength of the institution lies in the contributions of the many individuals and corporations who give willingly to the museum and aquarium in time, energy, and financial contributions. It has been a rewarding year. Gift dollars increased threefold during the year, reflecting early commitments to our master plan capital campaign, as well as generous bequests and diligent fund-raising efforts on the part of our Development staff. (See pages 33 through 35 for complete list of the generous individuals, corporations, and foundations that help support the institution.)

We have also seen a great increase in the employment of the museum and aquarium by organizations and corporations for meetings and receptions after hours. These uses, by groups such as PG&E, the National Geographic Society, IBM, and many others, have helped broaden awareness of the institution in the corporate community and have generated considerable income in support of museum operations.

In short, we start the new year with high hopes and a strong will as we prepare to launch the first phase of our major renovation of the museum and aquarium complex.

Rudolph A. Peterson  
*Chairman of the Board of Trustees*

**Photographs by James Patton unless  
otherwise credited**



# DIRECTOR'S REPORT



**Executive Director Frank H. Talbot**

**G**REAT INSTITUTIONS, like great nations, must be constituted of, by, and for their people. And certainly it is the people, the hard working men and women—both employees and volunteers—that are the Natural History Museum and Aquarium's great strength. Accordingly, and with our gratitude, the text and images in this annual report reflect the activities and accomplishments of the institution's dedicated and creative workforce.

There can be no question that much business of note has been accomplished during the year; the multifarious activities of the staff are documented in impressive detail in the following pages. But much of the year's work has been of necessity invisible to visitors, Academy members, and other supporters of the museum and aquarium: This year, the Academy's twenty-year masterplan has been completed to its conceptual phase.

More than three years of hard effort by staff and consultants have now resulted in innovative designs for a thoroughly rejuvenated Academy. The effort has been extraordinary, pushing all staff to evaluate the future role and character of the institution; but, it must also be said, such long-range investments in the future are hardly new. Since the museum first moved to Golden Gate Park in 1916, there has been an upgrading roughly once a decade, with the exception of the post-war 1940s. These have included Steinhart Aquarium (1923), Simson African Hall (1936), Mor-

risson Planetarium and Science Hall (1952), Wattis Hall of Anthropology and the Meyer Fish Roundabout (1976 and 1977). The world-class institution we see today is nothing less than the product of continuous planning for physical and educational improvements.

The first phase of our new masterplan provides for dramatic renovations in Cowell Hall, including a new museum shop, displays on our own research departments, and comfortable visitor lounges. Also planned are seismic upgrading and exhibit renovations in historic North American Hall; a new Life Through Time Hall in the Peterson-McBean Gallery, and a bridge linking this hall (now a deadend) to the Fish Roundabout. The first phase, costing \$6.2 million, is already three-quarters funded, but support is still being sought for some of its aspects, including endowments for one curatorial chair and for operating the new facilities.

The masterplan's second phase is an inward concentration that greatly strengthens the museum without expanding its existing architectural footprint. It includes space for two new classrooms and for better research laboratories, better public cafeteria and restrooms, provides novel and exciting living exhibits in the central courtyard, and reopens the closed whale-skeleton courtyard. The changes will make the Academy a more congenial place for visitors and will help greatly with its role in educating youngsters. The new museum will show more effectively the



**Author and television producer David Attenborough with Entomology Curator Emeritus Edward S. Ross and his wife Sandy Ross at the Claire Matzger Lilienthal Distinguished Lecture**





***Curator of Primatology Jane Goodall with Gordon Getty at an Academy dinner held in Ms. Goodall's honor***

wonderful adaptations of animals and plants to environments such as desert and rain-forest. We'll show, for example, how the continents have moved on the face of the earth and how in earlier times the lands and seas were inhabited by plants and animals intriguingly different from those we see today. Ideas are bubbling up from the staff for these plans.

As this planning has proceeded, the everyday projects of the staff have continued apace, augmented and enlivened by the participation of the institution's 670 volunteers. Every aspect of our work—education, outreach, display, research—is supported by volunteers. They help flesh out the bones and sinews of the museum and aquarium, keeping them strong and vigorous. Not surprisingly, our volunteers are highly diverse in their interests and backgrounds. They include, among others, busy community leaders, who provide leadership and expertise on the board of trustees, as well as school-age youngsters, who spend their Saturdays cleaning fish tanks and feeding the fishes, amphibians, and reptiles in the Aquarium.

To all of these generous volunteers and to the Academy's other supporters—visitors, members, corporate sponsors, and benefactors—we extend our thanks. This report documents who we are and what we are doing. Above all, we're glad that you're a part of it.

*Frank H. Talbot*

Frank H. Talbot  
*Executive Director*



***Mr. and Mrs. Lester Gunther, Sr. with Executive Director Frank Talbot***



# AQUARIUM

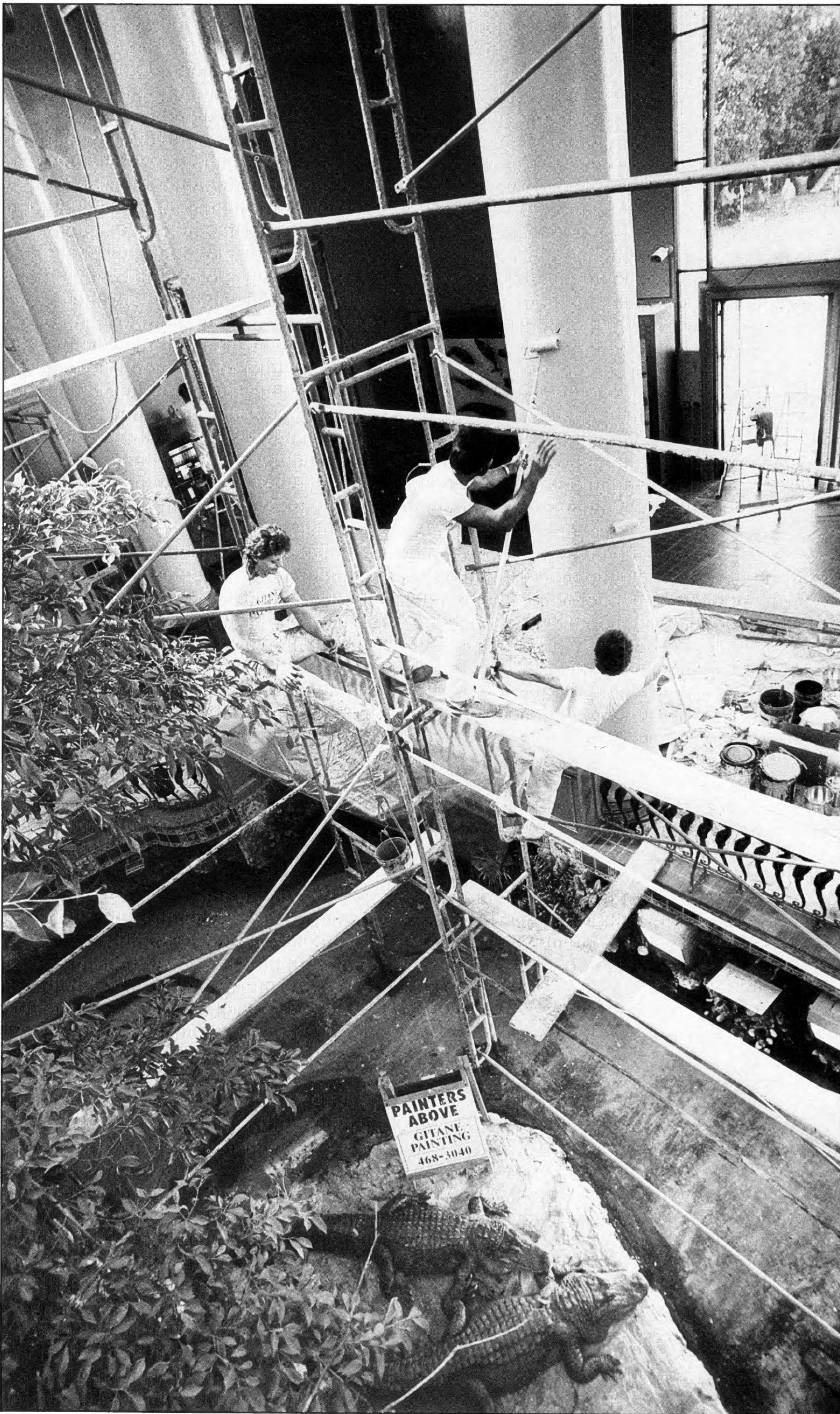
**John E. McCosker**  
*Director of Steinhart Aquarium*

THE STEINHART AQUARIUM underwent a major renovation this year, returning the entry façade to the historic grandeur that it proudly displayed at its opening in 1923. The addition of carpeting and a new paint scheme to the internal galleries has created a tranquil ambiance that allows a new level of enjoyment for our visitors and docents. Staff member Gloria Nusse researched the aquarium archives and worked closely with chemists from the L&H Paint Company, Gitane Painting Company, and Conklin Brothers' Carpeting to achieve an authentic and long-lasting coating for the swamp entrance. The project was made possible through the generosity of the Richard Levine Family, an anonymous donor, and Lester C. Gunther, Sr. Many other displays were constructed or improved, including a new Monterey Bay aquarium, an Amazonian mud bank display, and a Pacific salmon tank.

The Aquarium was honored by the visit of several distinguished committees and fish lovers, including Algerian President Chadli Bendjedid and his wife, and Wang Daohan, the mayor of Shanghai. Chief Engineer John Joseph Brennan joined the staff, and during the year he and his competent crew designed, installed, and maintained major portions of the vast water systems that are the life blood of the aquarium. A major effort of the engineering staff was also spent in improving the health and safety systems of the Museum complex. Within the year, we were sad to announce the passing of Butterball, the Amazon manatee who had resided here for eighteen years. A manatee replacement fund has been established in his memory.

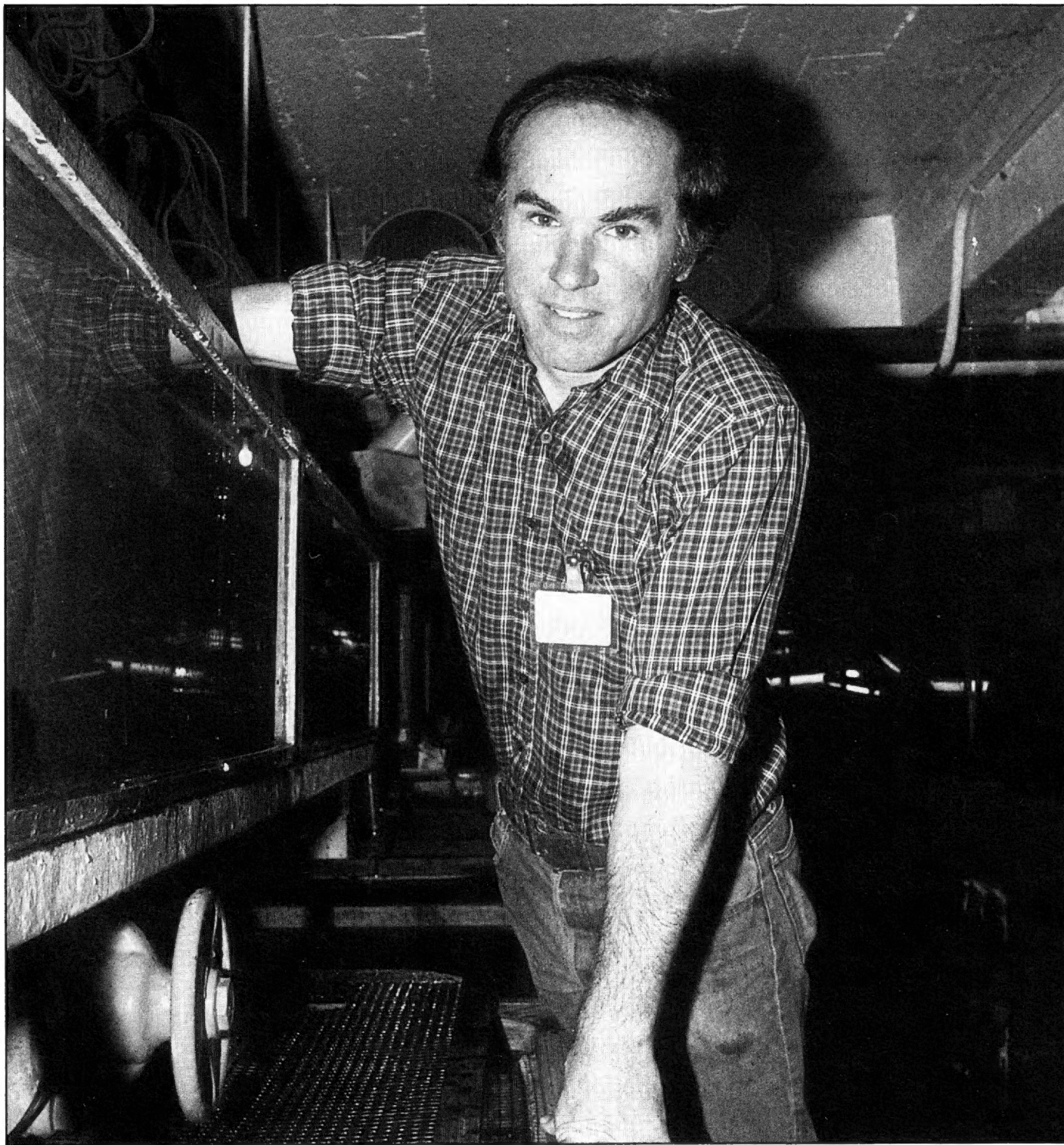
Aquarium staff and several supporters made trips to the far corners of the globe to return with specimens for our displays and research. Several of our diving docents plunged into tropical waters in search of specimens, including Lynn Dunne, who visited Baja California, and Pam McNay, who collected at the Turks and Caicos islands. Curator Tom Tucker and Assistant Curator John Hewitt attended a national conference to present papers about their work, and Hewitt was also invited to Baltimore to speak at the "Sharks: Recent Advances in Captive Biology" conference. Herpetologist Ed Ely collected specimens

***Renovations in the Steinhart Aquarium's alligator swamp***



Susan Middleton



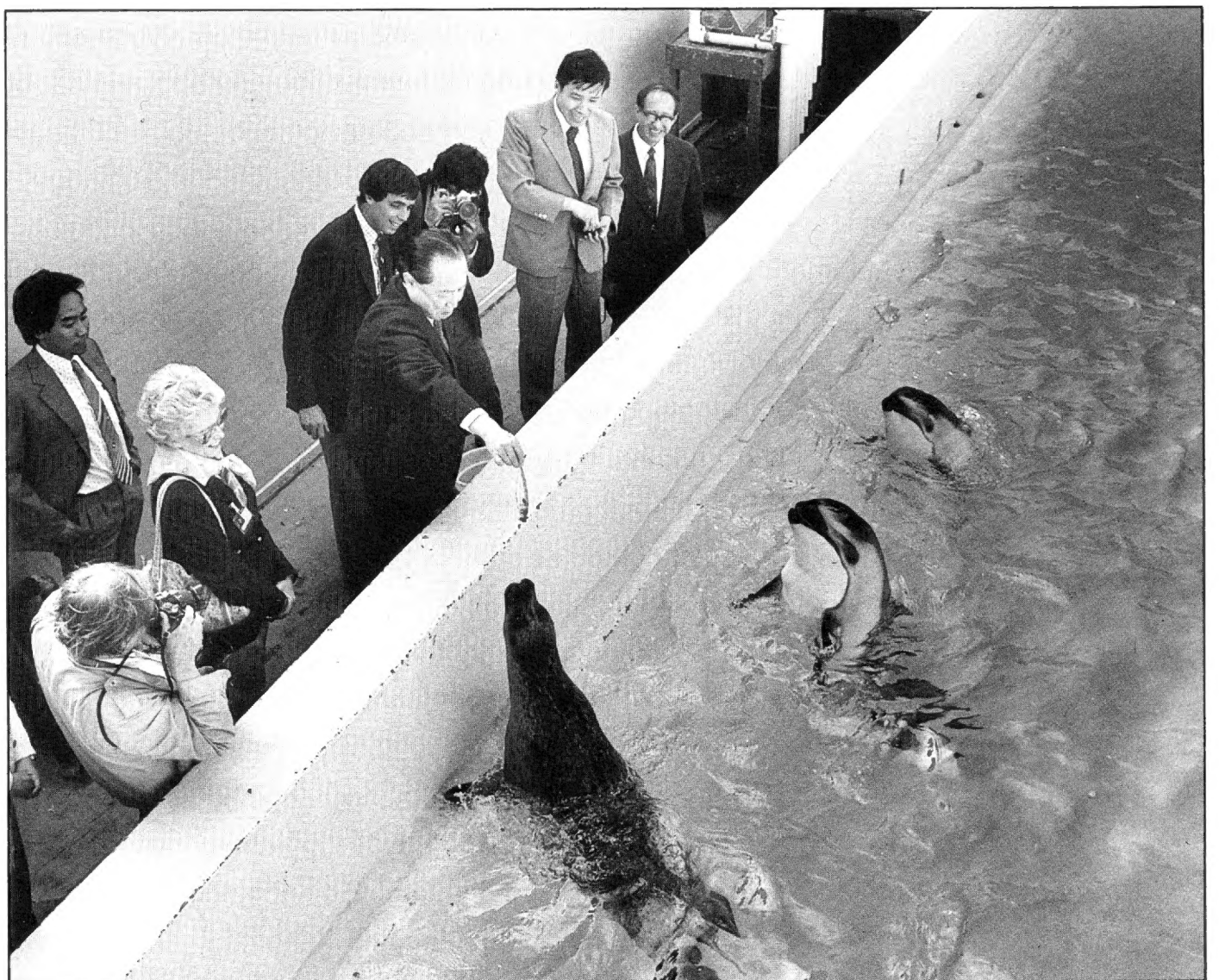


*Aquarium Aquatic Biologist  
Francis Glennon*

in southeastern Arizona and, with support from The Peregrine Fund, surveyed nesting populations of prairie falcons in northern California. The entire staff was active in collecting and contributing specimens for the opening of our new sister institution, the Monterey Bay Aquarium. Director McCosker lectured at several museums and universities and presented the Distinguished Lecture to the Delaware Museum of Natural History. He led a Academy field projects to Antarctica and Polynesia and returned with several new species of fishes and invertebrates. His white shark research projects were featured in a NOVA television special.

Substantial supplemental funding to the city charter-required aquarium support was provided by many individuals, including Mr. Foster Bam, Mrs. Marriner Eccles, Mr. and Mrs. Jeffery Meyer, Mr. John E. duPont, Mr. and Mrs. Richard Levine, Mr. and Mrs. W. W. Budge, Mr. Carlton Colombat, Mr. Al Giddings, NBC Television, and many other individuals and corporations.

*The mayor of Shanghai, Wang Daohan, visiting the Aquarium*





# PUBLIC PROGRAMS

**Eugene F. Behlen**  
*Director of Public Programs*

THE PAST year was one of accomplishment and energetic planning for the departments dedicated to Public Programs. The details of the Planetarium, Education, and Photography department's activities provide a sense of the achievement that the staff members feel as they look back over the year. Tough budgets, changing staff structures, and time limitations give the accomplishments a special luster.

Public Programs create the image of the Academy that our one and a half million visitors take away with them. In turn, that image

helps to generate support for research and collecting, which are so important to the Academy and the scientific community. Further, the public image of our museum helps to make it an important civic center in San Francisco and one of the great museums of the United States. The coming year will be busier than ever: planning and implementing major new exhibits, refurbishing the Morrison Auditorium, and reforming Planetarium and Education programs.

## PLANETARIUM

**Steven B. Craig**  
*Chairman*

OVER THE YEAR six feature shows were presented: "The Water World," by James Sweeney and Linda Grandke-Kulik, "The Great American Star Factory," by Richard Sanjour, and "The Christmas Star," "Circles of the Sky," "The Clouds of Magellan," and "Death Stars and Dragon Tales," by Bing Quock. "Exploring the Skies of the Season," the popular night-sky presentation, was offered 165 times. Together, these shows were attended by a total of 129,654 people. School attendance was 29,072.

Laserium shows offered included "Crystal Odyssey," "Dark Side of the Moon," "Laser Rock Platinum," and "Laserspace."

The Planetarium concert series entered its second year, coordinated by Elaine Thornburgh. The fall series featured classical music, including La Corte Musical, Bay Area Rapid Brass, and Michael Rado and Friends. Ethnic music was featured in the winter-spring series, with the Four Winds American Indian drum group, the Flowing Stream Ensemble, the Simcha Orchestra, the Pan Alkubel-an, and Jose-Luis Orozco. Additional concerts were given by the San Francisco Conservatory of Music's New Music Ensemble and Preparatory Chorus and by the electronic groups Emerald Web and A Private View.

Special Planetarium shows were presented to groups from Pacific Gas & Electric Company, IBM, and the Bohemian Club. The Planetarium also hosted meet-

***The 2-ton Old Woman Meteorite arrives  
for display at the museum***



Susan Middleton





**Assistant Planetarium Manager  
Bing Quock and Artist/Photographer  
Lynnette Cook**

ings of the Bay Area Skeptics and the San Francisco Amateur Astronomers.

In September of 1984, the Planetarium closed for maintenance, a job that included repainting of sections of the dome, repair of seats, and installation of new circuitry that provided a fourfold increase in projector capability.

Despite some initial delays, progress is being made in the renovation of the star projector's starplates and eyelid mechanisms, with services contributed by several local industries. Due to time constraints, former Planetarium Supervisor Tom Gates was forced to relinquish his role as project coordinator. The project is now being overseen by Chairman Steven Craig, with valuable assistance from associates Allan Wilson and Ron Hipschman.

The Planetarium's first formal internship introduced Patrick Yuschenkoff to many aspects of Planetarium operation, including administration, show production, audio engineering, projector construction, optics, art, and photography.

## EXHIBITS

Robert Kosturak  
*Chairman*

WITHIN THE YEAR the exhibits staff welcomed Michael Shreiber, Chief of Design, and Dean Weldon, Chef of Production, both accomplished professionals who bring a wealth of experience and expertise to these key staff positions. Other new additions to the design and production teams reflect an ambitious exhibition schedule. The remodelled department optimizes efficiency and better accommodates our staff and goals.

An October celebration, held beneath dramatically illuminated and rotating planets, marked the completion of the refurbished Hohfeld Earth and Space Hall. All the new exhibits stress the most current scientific thinking on the formation and dynamics of our planet, solar system, and universe. This renovation was made possible by generous contributions from the Hohfeld family, BankAmerica Foundation, Bechtel Group, Inc., Chevron USA, FMI Brisbane, Hewlett Packard, Pacific Bell, Toledo Scale, and Wells Fargo Foundation.

"Circles of the World: Traditional Art of the Plains Indians" informed visitors to our special exhibits galleries from January

through April. This important traveling exhibit, organized by the Denver Art Museum, included more than 150 objects that chronicle a century of native American history and artistic development. Financial support for "Circles of the World" was provided by the American Express Foundation, the National Endowment for the Humanities, and the National Endowment for the Arts. A concurrent installation in Cowell Hall, "Contemporary Art from the Plains," featured original works by six living native American artists.

The glory of the twenty-third Olympiad shown in the McBean-Peterson Galleries as the exhibit "Shooting for the Gold" was displayed while the Summer Olympic Games took place in Los Angeles. Fuji Film sponsored this display of eighty photographs by Walter Ios honoring the spirit and determination of the American athletes who took part in final trials for the 1985 Olympics.

Fly fishing, a contemplative but demanding sport, requires patience, technique, and a knowledge of aquatic entomology. An exhibit organized in conjunction with the American Museum of Fly Fishing of Manchester, Vermont—"Anglers All: Man and His Environment through 500 Years of Fly Fishing"—presented the world's finest collection of angling artifacts.

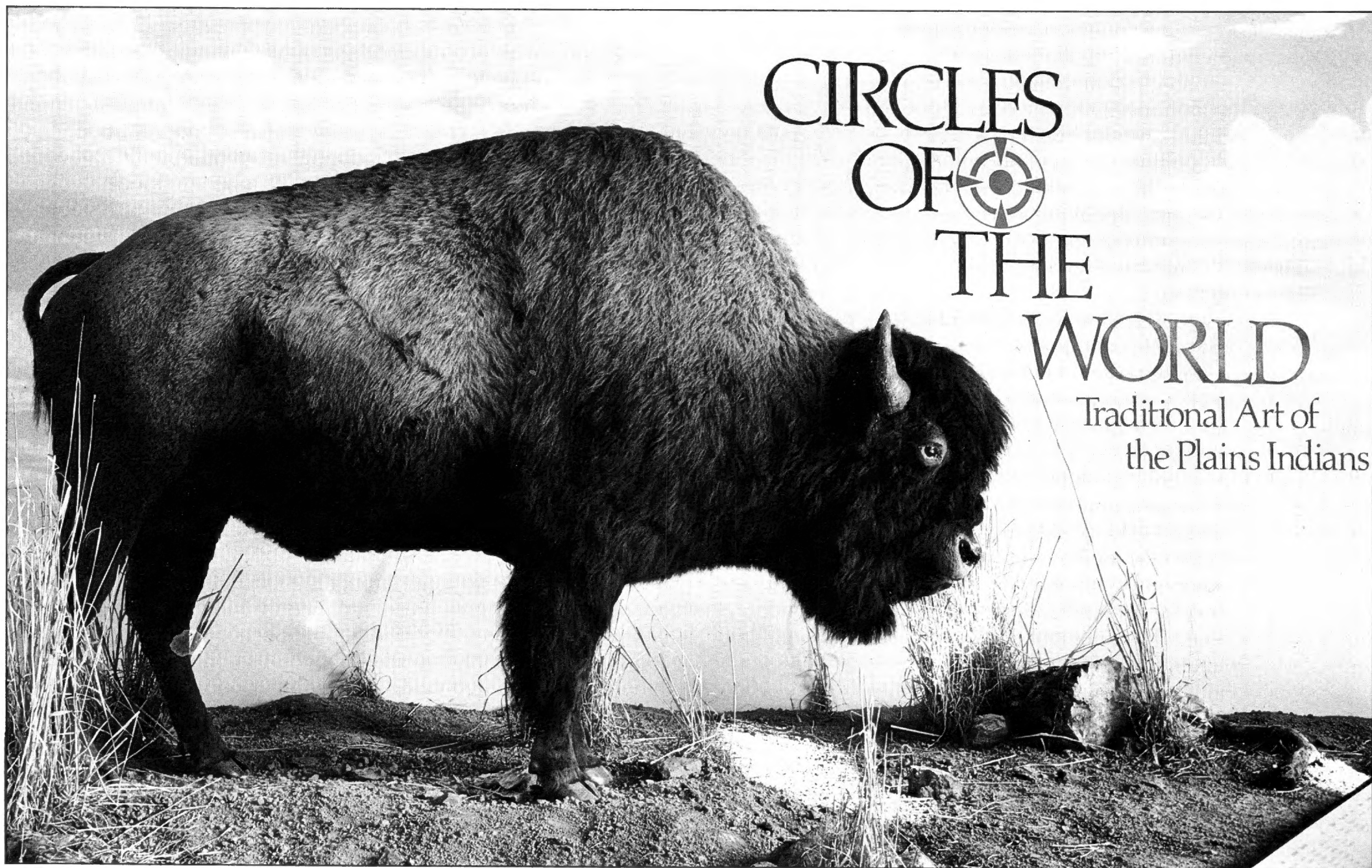
Birdwatchers and fine art connoisseurs flocked together in the McBean-Peterson Galleries to see "Birds in Art," a traveling exhibit of paintings by international wildlife artists. Organized by the Leigh Yawkey Woodson Art Museum of Wausau, Wisconsin, this exhibit was sponsored by Gulf Oil, a subsidiary of Chevron USA.

"Silent Partings: Rare and Endangered Plants of California" drew attention to the quiet but alarming plight of several native species. This juried exhibition of sixty-one original works of art marked the 1985 national meeting of the Garden Club of America. Mrs. A. W. Gillette provided the major funding and inspiration.

In this "Year of India," as major exhibitions of the subcontinent's culture and art take place throughout the world, we presented "Passage Through India," seventy-seven images by local photographer Robert Holmes. Other photographic exhibits included "Behind the Mountains" by David Cross, and the winning entries of the "Third Annual Photography Contest for Young People," co-sponsored by the Junior Academy and KRON-TV.

In the Cowell Gallery "Contemplations,"





*The entrance diorama for the exhibit "Circles of the World"*

an installation of Kevin Aguilar's large format, airbrushed paintings, presented superbly executed, close-up views of the natural world. In Lovell White Hall "Eyes Open Unlimited" highlighted the work of visionary painter Andreas Nottebohm—imaginative images of worlds beyond our solar system. A giant whale sculpture by Larry Foster brought life to the Academy's front portico for four months, to the delight thousands of children. And to help San Francisco's Department of Parks and Recreation celebrate the grand reopening of the Golden Gate Park carousel, we displayed the elegant original model of that famous merry-go-round.

In June Research Assistant Lowell Dingus, busy planning for Dinofest '85 and Life Through Time Hall, accepted an invitation to speak at a seminar for the Department of Earth and Space Sciences at UCLA. The title of his talk was "Estimates of Temporal Completeness and Their Application to Paleobiological Questions."

*Exhibits Chief of Production Dean Weldon*



**Junior Academy students building  
dinosaur models during "DinoFest '85"**

## CABINET SHOP

Arthur Rostoker  
*Supervisor*

In recognition of an increased emphasis on creating fine exhibitry, the Cabinet Shop moved this year into the Public Programs Division to work as an integral part of the Exhibits Department production staff.

A major effort during the year was the fabrication and installation of the exhibit fixtures for "Hohfeld Earth and Space Hall." Significant architectural changes were also made in Lovell White Hall and the adjacent galleries in preparation for "Circles of the World." Temporary structures erected for that exhibit were later modified for Anglers All. Repair and upgrading of the special "waistband" exhibit cases in the Wattis Hall of Man took place this year, along with important renovations in Cowell Hall and the McBean-Peterson Galleries to accommodate the planned Dinofest '85.

Each of the Academy's departments has required some repair, alteration or addition to its furnishings and facilities during the



year. Among the most important of the recent projects completed by the Cabinet Shop were a sophisticated new projection booth for the Trustees' Room, a shed to house specialized laboratory equipment for the Ornithology and Mammalogy Department, custom work-tables and storage cabinets for the Photography Studio, and finish remodelling in the Exhibits Department.

## EDUCATION

Susan E. Douglas  
*Chairman*

THIS WAS A YEAR of increased effort in teacher workshop presentations, with nearly 500 teachers from throughout northern California participating. A workshop to highlight the teacher materials accompanying the David Attenborough series "The Living Planet" was held with the San Francisco Public Schools. Another workshop to distribute earthquake preparedness literature and teaching ideas, was held with Marin, San Mateo, and San Francisco school districts. The Docent Council presented the educational activities of the Academy at another workshop. Two workshops were held to introduce teaching supplies to augment the exhibition "Circles of the World: Traditional Arts of the Plains Indians." Other educational activities associated with this exhibit included tour guide training, tour scheduling, Adult Education courses and workshops, and lending slide sets, shown to 2,500 youngsters in their classrooms. The exhibition closed with a meeting of the Bay Area American Indian Education Council, showcasing the programming and cultural heritage of native American youth. It attracted a large public audience that included 388 native Americans.

The thirty-second annual San Francisco Bay Area Science Fair attracted 368 students, already winners in their districts, for



**Exhibit Artist Michael Cole**

regional judging of their projects. The continuing success of the Science Fair is evidenced by the impressive array of projects entered each year by hundreds of students, and by the ever-widening support accorded by business and industry, school authorities, science teachers, and scientific organizations in this region.

"A Festive Intergenerational Event" was the title for the poetry recital of the STEP program held at the Academy in May. Seniors Teaching Educational Programs (STEP) is a project designed to provide for self-expression for seniors in long-term care facilities. A booklet of the seniors' poetry and the poets' biographies written by children who interviewed them was distributed.

## JUNIOR ACADEMY

Brian Gibeson  
*Supervisor*

The Junior Academy program provides quality activities in natural sciences for young people from six to sixteen. One hundred and thirty courses and field trips were offered in general biology, chemistry and astronomy, as well as specific courses in ichthyology, herpetology, marine biology, and biological illustration. Field activities included single-day trips to NASA-Ames Research Center, San Francisco Bay Wildlife Refuge, Año Nuevo Reserve, and Pepperwood Natural History Reserve. Whale-watching from the air gave young people the opportunity to witness the annual migration of California gray whales from "Big Red," a De-Havilland Otter sea plane. There were 1,829 Junior Academy members at the end of the year.





**Docent Faith Jansen touring the  
Freewheelers of Laguna Honda at the  
“Circles of the World” exhibit**

## ADULT EDUCATION

Susanne Tucker  
Coordinator

Throughout the past year, the Adult Education program offered seventy-eight classes in the natural and physical sciences and anthropology. These courses were filled with 1,701 participants and included the Behavior of Sharks, the Techniques of Photography, Fish-Printing, Basket Weaving, and the Four Great Questions of Astronomy. Sixty-eight study tours, with 2,155 participants, visited the Academy's Pepperwood Natural History Preserve to study its flora and fauna, Lassen National Park to study geology, the Channel Islands to study marine life, and the new Monterey Bay Aquarium. The Adult Education Office continues to offer local teachers in-service credits through their districts for participation in Academy activities, in addition to providing enrichment opportunities for the Docent Council members.



Judith Steiner



## VOLUNTEER SERVICES

Diane Butler  
Coordinator

The Academy's volunteer staff of more than 600 individuals contributed more than 40,000 hours during the past year. Volunteers worked alongside staff members in every department: repairing microscopes, cleaning fish tanks, mounting specimens and stuffing envelopes—providing services that would not otherwise be affordable. In addition to departmental duties, special activities that required volunteer assistance included the Leakey Foundation lecture and reception, the Fellows' Dinner, exhibit openings and symposia and the David Attenborough lecture. A new volunteer post of Academy Escort was initiated to assist the thousands of visitors annually to find their way through locked doors to their destinations. These volunteers work side by side with the stalwart and dedicated Information Desk staff to welcome and assist the public.

The Discovery Room, also staffed by volunteers, continued to be a popular exhibit area, attracting 93,112 visitors, many of them students and their teachers. The audience was almost one third adult, reconfirming that the room delights “children of all ages.”

*A close encounter during a weekday  
“Science In Action” show*





*Museum volunteers Paul Roth and George Swortfiguer at the public information desk*

## PHOTOGRAPHY

Susan Middleton  
*Photographer*

Jim Patton  
*Assistant and Interim Photographer*

THE PAST YEAR has brought change to the Photography Department. In March 1985 Susan Middleton began an eleven-month leave of absence to assist photographer Richard Avedon in New York City. She is coordinating the final production of a major exhibition and book, "In the American West."

Assistant Photographer Jim Patton assumed the position of Interim Photographer in her absence. Photographic assistants Judy Steiner, Carolyn Herterich, and Alexandra Baele also worked with the department during the year.

The department's primary responsibility is to create images of use to the Academy's other departments. These images include color and black-and-white transparencies of artifacts, specimens, and art for publication and display; Kodalith film for in-house printing, color and black-and-white portraits of Academy staff and visitors for publication and display; promotional images for the Public Information and Development departments; documentary negatives, slides, and prints of exhibit preparation and openings; documentation of special events, fundraisers, and lectures; coverage of distinguished visitors; and documentation of architectural models and Education Department classes and trips.

Noteworthy projects included portraits of Rodney Fox and Jane Goodall; location photography of Lick Observatory and Robert Stebbins for *Pacific Discovery*; documentation of the Earth and Space Hall installations; and documentary and promotional photography for DinoFest '85.

Volunteers and staff collaborate to keep the Discovery Room in good order and filled with visitors.

The Docent Council was called up for 636 tours for 17,403 persons, both school groups and adults. The Supervan outreach program made 105 trips to classrooms, daily service at the Tidepool, and appearances at several environmental fairs held by other organizations. Docents also participated in three teachers' workshops, provided hospitality and highlight tours for the 600 delegates of Garden Clubs of America meeting here and assisted at the members' Open House. From January through April docents joined forces with other volunteers for tours of the exhibit "Circles of the World," giving 252 tours to 6,819 persons.

Many docent projects were completed during the past year under the leadership of Ed Hartsook, Docent Chairman, including an earth sciences course taught by Geologist Peter Rodda, which added twenty-six persons to those qualified to conduct fossil and geology tours. This course also included some basic astronomy for interpreting the new exhibits in Earth and Space Hall. The basic docent training manual was revised, an Aquarium manual was brought to near completion, and classroom activity packets for all tours were produced.

Continuing education also played a role in the year's activities, with trips to nature sites accompanied by Academy scientists as

well as visits to other institutions with similar goals. Several docents were called upon to lead workshop's at the National Docent Symposium hosted by the Oakland Museum.

In June the Academy honored its volunteers with a formal reception in the Wattis Hall of Man to pay tribute to the dedication and competency of this loyal band of supporters. Executive Director Frank Talbot was generous in his praise and recognition of the volunteers' role in the success of the Academy. Each individual listed on pages 36 through 38 can share this praise and take pride in the knowledge that the Academy is enormously grateful.

# RESEARCH

**Frank Almeda**  
*Director of Research*

**R**ESearch is clearly the backbone of the Academy's educational mission. Many of our institution's exhibits, public programs, publications, and other activities serve as conduits for the dissemination of knowledge derived from basic scientific research. As experts in their chosen disciplines, Academy curators have ultimate responsibility for the collection and maintenance of properly documented samples, living and preserved, of geological specimens, plants, animals, and artifacts of human cultures from around the world. The Academy's internationally significant collections represent an irreplaceable resource that is made available to the scientific community, state and federal agencies, other educational institutions, and the interested public. As a focal research resource these collections are used by our own scientific staff in their efforts to discover organismic diversity, to find patterns within this diversity, and to investigate the processes that have produced these patterns. In the broader sense, our research effort seeks to elucidate what exists and has existed in our planet and

attempts to answer the questions of how the Earth and its inhabitants have evolved and are continuing to change.

With activation of the Academy's G. Lindsay Field Research Fund the year witnessed an upsurge of field research and collecting activities. Academy staff organized or participated in expeditions to western Canada, the southwestern United States, Mexico, Belize, Costa Rica, Africa, India, Burma, Thailand, New Caledonia, and the Philippine Islands.

During the latter part of the year we also took a serious look at the quality and productivity of our research staff. This analysis was accomplished by peer review and a critical assessment by a panel of three senior museum directors. The process was not without tension because it was conducted by some of the sharpest and most respected colleagues in our profession. We were heartened by their assessment, which praised the Academy for "quality and excellence."

## ANTHROPOLOGY

**Norman Hammond**  
*Chairman and Curator*

**N**ORMAN HAMMOND, a Mesoamerican archaeologist and Maya scholar from Rutgers University, joined the anthropology staff in July 1984 as the first holder of the department's Irvine Chair. A subsequent reorganization of the department placed Robert Sayers, formerly a visiting assistant curator, in the post of Senior Collections Manager, while Charles Cecil joined the staff in January as Curatorial Assistant. The department now has four permanent, full-time staff members (including Secretary Terri Berman) and a half-time Traditional Arts Coordinator, June Anderson.

Dr. Hammond's research activities took him to both Central and South America during the year. From mid-January through April, he directed the Nohmul Project in Belize, C. A., an undertaking sponsored jointly by the Academy, The National Geographic Society, The British Museum, and Rutgers University. His crew (including Charles Cecil, who headed one of the project units) mapped large portions of the ancient Maya city and excavated major structures—a temple pyramid, a seven-door

*Anthropology Curatorial Assistant Charles Cecil and Senior Collections Manager Robert Sayers*





"palace"—in the ceremonial center. A two-volume report on Dr. Hammond's earlier work at Nohmul was published in May by British Archaeological Reports of Oxford, England.

Earlier in the year, in November and December, Dr. Hammond with Research Associate and project co-director Dr. Karen Bruhns of San Francisco State University, mapped and excavated the site of Pirincay in the Paute Valley of southern Ecuador. Preliminary findings at this important highland/lowland trading center, dating ca. 1500–500 B.C., were reported by Drs. Hammond and Bruhns at the Institute of Andean Studies Annual Meeting, UC, Berkeley, in January.

Dr. Hammond also lectured at UCLA, USC, The University of the West Indies in Belize City, and at the annual meetings of the Society for American Archaeology in Denver. In November, one of his talks inaugurated the new National Geographic Society lecture theatre in Washington, D. C., while in May he delivered the Curl Lecture to the Royal Anthropological Institute in London.

Dr. Sayers lectured on various topics during the year to members of The M. H. de Young Memorial Museum, The Asian Art Museum, The Commonwealth Club of San Francisco, and The San Francisco Business League. He also trained tour guides for the Academy's popular Plains Indian exhibit, "Circles of the World" and served as department administrator during Dr. Hammond's absences.

As collections manager, Dr. Sayers began a substantial reorganization of the anthropology storeroom with the objective of improving the safety and accessibility of the collections. He was assisted in this project by members of the staff as well as by volunteers Verdi Miller, Janet Aitken, and Wen-hao Chou, a visiting scholar from the National Museum of Natural Sciences, Taiwan, Republic of China.

For a second year, Don and Polly Fellers of Santa Rosa contributed artifacts to our important Rollo H. Beck Pacific Collection, which now totals 408 specimens. Photographs, newspaper clippings, and Beck correspondence from the 1920s were placed in the Academy Archives. Other donations of Oceanic materials included a rare piece of Yapese stone money secured for the Academy (with government permission) by Russell Curtis and John Tamaglibian, and a New Guinea mask given to us by Brenda Motomura of Richmond.

Our California and Southwestern Indian basket collection was augmented by Robert Hand of Wofford Heights (64 baskets), Mar-

garet G. Molarsky of Ross (3 baskets), Josephine T. Cline of San Francisco (6 baskets), and the estate of Liliane D. Wells (13 baskets). Patricia Putney of San Mateo donated seven Navajo rugs plus several Plains Indian costume items. Other North and South American materials were contributed by Mary Collin, Normand Hammond, Mary Huston, Mrs. Henley Miller, and Elizabeth Rieger.

During 1984–85, department collections were lent for exhibition to the Jesse Peter Memorial Museum at Santa Rosa Junior College, the C. E. Smith Museum at California State University, Hayward, the Adan E. Trenganza Museum at San Francisco State University, and the Western Regional Convention of the National Association of Watch and Clock Collectors at San Jose. In addition, our camera collection was transferred, on long-term loan, into the care of the International Photographic Historical Organization, San Francisco.

Folklorist June Anderson's Traditional Arts Program highlighted the performing, craft, and culinary arts of some thirty ethnic groups resident in the Bay Area. This weekly series, funded in 1984–85 by the Paul L. and Phyllis Wattis Foundation, will be described at length in a forthcoming *Museum News* article entitled "A Museum Folk Arts Program as Community Outreach." Special events during the year included a "Christmas Trees Around the World" festival in December and fourteen American Indian programs linked to the "Circles of the World" exhibit. Ms. Anderson also coordinated a monthly Young Audiences, Inc. series (funded by the McKesson Foundation) aimed at visiting classes from San Francisco's public schools.

Terri Berman also assisted with the "Circles" exhibit. She was consulted on the script for the planetarium show, "Circles of the Sky," and on the selection of artists and works to appear in the gallery show, "Contemporary Art of the Plains: Six Native American Painters"; her acquaintance with artists on the Pine Ridge Reservation in South Dakota (where she spent the month of August) was especially valuable in the latter instance. In addition to these activities, Ms. Berman designed and edited the department's first newsletter, "Anthropology at the Academy."

Dr. Diane Lee Carroll, Research Associate, completed a catalog manuscript, "Coptic Textile Ornaments in the Carl Austin Rietz Textile Collection" and began work on a paper, "The Dyer's Recipes in the Papyrus Graecus Holmiensis." She also submitted a grant proposal to The National Endowment for the Humanities in anticipation of forthcoming research on the Greek textile industry of antiquity.

## AQUATIC RESEARCH

John E. McCosker  
*Curator*

THE DEPARTMENT OF Aquatic Research, founded in 1982, has sponsored a series of projects involving Aquarium staff and grant-funded research associates. The Marine Mammal Environmental Enrichment Project was expanded with the construction of an observation blind above the dolphin habitat. Fitted with computers and an array of sensors and triggers, the program will allow animal behaviorists to observe the development of choices by the marine mammals to expand the sensory stimuli within their environment. Dr. Markowitz is aided in this project by San Francisco State University students Elizabeth Galbreath and Eric Carlson. Ed Miller continued to study the reproductive behavior of California yellowtail, a commercially important but depleted species, in the Fish Roundabout. Miller was able to raise the larvae of yellowtail that had spawned in captivity and will attempt, with Ron Lipton, to adapt that technology to the spawning and rearing of striped bass in captivity. Other Aquarium personnel participated in research separate from their staff responsibilities, including Christina Slager's studies of the population dynamics of Magellanic penguins in Patagonia and Bruce Hiler's breeding program for poison arrow frogs.

Aided by equipment gifts from Hewlett-Packard and supported by NBC television, John McCosker and John Hewitt joined Research Associate and cinematographer Al Giddings on expeditions to the Farallon Islands and Neptune Islands, South Australia, to study the great white shark. Hewitt's research concerning white shark physiology during stress and McCosker's concerning attack behavior and predator-prey strategies have yielded findings that have significantly changed previous thoughts about sharks. McCosker also continued his NSF-supported studies of ophichthid and muraenid eel systematics that will result in the publication of a volume for the *Fishes of the Western North Atlantic* series.





**Botany Associate Curator Alva Day**

## BOTANY

Dennis E. Breedlove  
*Curator and Chairman*

THE SIZE of the herbarium was increased by some 22,000 specimens during the fiscal year. Our accessions continue to reflect our interest in the flora of Latin America as well as western North America. Other significant additions to the collections included plants from China and the eastern Himalayas. The department loaned a total of 14,476 specimens in ninety transactions to professional scientists and graduate students at foreign and domestic institutions. The department welcomed and assisted 325 professional scientists and graduate students who came to study spec-

imens or consult our holdings of botanical literature. In addition, twenty group tours were given to visitors from colleges, universities, and special interest groups. The staff also answered over 300 inquiries from members, physicians, regional poison centers, state, federal and private agencies.

During the second year of a three-year grant, the National Science Foundation provided \$64,800 for the salaries of two curatorial assistants.

New counter tops and chairs were acquired for the preparation room through generous donations from the California Botanical Club and the Gordon True Memorial Fund.

The department received a major contribution of \$5,500 to the newly created Botany Expedition Fund in addition to several smaller donations.

Dr. Breedlove spent two months collect-

ing and making observations on *Quercus* in Mexico. Approximately 5,000 specimens were gathered. He also spent one month studying at the National Herbarium in Mexico City. Dr. Breedlove completed his checklist of the Flora of Chiapas.

In addition to his administrative responsibilities as director of research Dr. Almeda completed an account of the Melastomataceae for the forthcoming *Guide to the Flowering Plants of the Hawaiian Islands*. He continued work on treatments of the Melastomataceae for the *Flora of Chiapas* and the *Flora of Nicaragua* and initiated an SEM seed morphology study of the tribe Rhexieae in concert with a revision of *Arthrostema* that is nearing completion. Dr. Almeda also led a three-week natural history tour to the Galápagos Islands, highland Ecuador, and southern Peru.

Dr. Day prepared technical script for and helped jury the exhibit "Silent Partings" on rare and endangered plants of California. Her research on *Gilia* this year has involved pollen comparisons using SEM, as well as chromosome cytology. Field work on the project took her to Mendocino County for several days in June. She is also preparing a taxonomic revision of the Mexican genus *Loeselia*, in collaboration with Dr. Breedlove.

John Thomas Howell, with the help of volunteers, has been working on various aspects of California plants and continued his work on a flora of the Sierra Nevada.

Dr. Bruce Bartholomew participated as one of four U.S. botanists in the 1984 Sino-American Botanical Expedition to Yunnan, China. This expedition was supported by the National Geographic Society and the Chinese Academy of Sciences. The excursion also involved the Arnold Arboretum of Harvard University, the Smithsonian Institution, the Missouri Botanical Garden, the Institute of Botany in Beijing, and the Kunming Institute of Botany. The expedition resulted in the collection of approximately 20,000 plant specimens, which have now been distributed among the six participating institutions.

Dr. Leslie Landrum completed his year as Tilton Fellow. His monographic treatment of various genera of Myrtaceae was accepted for publication by the journal *Flora Neotropica*, and a paper on the variability in embryos in the subtribe Myrtinae was accepted by *Systematic Botany*. Dr. Landrum is presently working on a floristic treatment of the family Myrtaceae in Chile.

Mona Bourell, on leave of absence from her curatorial assistant position, is collecting botanical specimens during her stay in South Africa.



**Entomology Associate Curator**  
**Wojciech Pulawski**

## ENTOMOLOGY

Wojciech J. Pulawski  
*Chairman and Associate Curator*

THE DEPARTMENT continued its normal activities throughout the year, namely curation of its collection and research. An important event was the addition of a collections manager to our staff.

The collection presently contains about 7,441,530 processed insects and arachnids, of which 120,781 were added during the year. They came from 139 sources (individuals, institutions, or expeditions). A total of 78,126 specimens were loaned to 159 recipients in the U.S.A. and 25 foreign countries.

The department received 2,726 visitors, including 584 visits by professional entomologists, 219 by graduate students, 391 by undergraduate or high school students, and 1,532 others who came as individuals or in groups to use or view its facilities.

Eight persons were awarded grants-in-aid totaling \$4,000 from the Exline-Frizzell Fund for Arachnological Research, in cooperation with the Liaison Committee of the American Arachnological Society. The fund

is a permanent program administered by the Entomology Department.

The Scanning Electron Microscope Laboratory, an interdepartmental facility located in the Entomology Department, provided service to the Academy research staff.

During the year, the National Science Foundation provided \$80,000 for the care and use of the systematic collections of the Entomology Department, specifically for supplies and technicians' salaries.

Dr. Arnaud completed editing of a 720-page Festschrift (by Arnaud and R. S. Lane) honoring Dr. C. B. Philip on his eighty-fifth birthday. The Festschrift contains three articles by Dr. Arnaud (totaling over 450 typescript pages).

Dr. Kavanaugh acquired several thousand important additional *Nebria* specimens for his monograph of this ground-beetle genus. These have been processed and studied, and distributional and other data from them have been recorded and added to the database for monographic treatment of this genus. Distribution maps were updated for all Nearctic *Nebria* taxa, and a revised key to species was written. Dr. Kavanaugh also completed preparation and study of specimens collected in the Queen Charlotte Islands, British Columbia, in 1983, and also a detailed analysis of the carabid fauna of that archipelago.

Dr. Pulawski continued his revision of North American *Tachysphex*; he examined over 3,000 additional specimens of this genus; several new species were described (in manuscript), and data on geographic distribution have been updated; over 100 scanning electron micrographs of morphological details have been taken.

Dr. Briggs completed the manuscript entitled "The Cave Fauna of California" (co-authored with three other persons).

Dr. Arnaud spent a week in the Musée National d'Histoire Naturelle, Paris, France, studying specimens of *Hilara* flies, and also made collections of these flies in Switzerland.

Dr. Kavanaugh spent two weeks in the southwestern U.S. (Arizona, New Mexico, Colorado), and three weeks in Tambopata Nature Reserve, Madre de Dios, Peru.

Dr. Pulawski spent six weeks in California, Arizona, New Mexico, and Texas. Dr. Ross completed his seven month trip through Europe and Turkey on 1 October 1984. D. Weissman and V. Lee collected on Isla Cedros off the coast of Baja California.

Dr. Scudder served as president of the Pacific Coast Entomological Society for the year 1984. V. Lee is the society's secretary, W. Pulawski the society's treasurer, and P. Arnaud the chairman of the society's historical committee.



# HERPETOLOGY

Robert C. Drewes  
*Chairman and Associate Curator*

THE DEPARTMENT OF HERPETOLOGY processed a total of 157 loan transactions involving a total of 3,933 specimens and responded to requests for information involving 8,342 specimens. Over the last five years the department has responded to loan requests for over 75,000 specimens, approximately one-third of the total collection. Over twenty scientific publications based in whole or in part on specimens in the collections were published during the year.

A total of 1,512 specimens were added to the collection of the department during 1984-85. Major contributions were:

- 365 specimens from the Palawan Island field survey, collected by Angel C. Alcalá and Jens V. Vindum. This trip was sponsored by the G. Lindsay Field Research Fund and the captain and crew of the S. V. Sol.
- 308 specimens from New Caledonia, collected by Aaron Bauer;
- a total of 437 specimens from Egypt, Kenya, South Africa and Zaire obtained by Alan Channing, Robert C. Drewes, Leo Hoervers, Martin Pickersgill, Steven Spawls, Mike Ryan, and Van Wallach;
- 160 specimens from the Solomon Islands, collected by Michael McCoy;
- 102 Netherlands Antillean specimens collected by Jens V. Vindum;
- a small but valuable collection (48 specimens) from Iraq, collected by Saman Af-rasiab of the Baghdad Museum of Natural History.

Additional material obtained during a six-week study of the New Caledonian herpetofauna by Aaron Bauer and Larry Wishmeyer awaits cataloging. These specimens from a rarely studied area were collected during research funded by the G. Lindsay Field Research Fund.

The department completed a five-year project, supported by the National Science Foundation, updating its collections from North America, which contain approximately 65,000 specimens.

Seventy professionals and students spent more than 120 visitor-days using the department's facilities. Our NSF facilities grant provided funds for working visits by Leo G. Hoervers (field associate) who visited the department and worked on our collections from Somalia and Madagascar; Dr. Sushil Dutta, University of Kansas, who studied our holdings of Indian and Sri Lankan frogs; and

Dr. Donald G. Broadley, National Museums and Monuments of Zimbabwe, who reviewed our holdings of African snakes.

Dr. Robert C. Drewes left in January 1985 for an eight-month sabbatical at Oxford University and the British Museum of Natural History, continuing his research on African frogs systematics and on waterproof frogs. During this time he received a grant from the In-House Research Fund to tour European museums and study their collections of African frogs. Earlier in the year, he served as coordinator of the SFSU/CAS graduate course "Advances in Biosystematics."

Dr. Alan E. Leviton continued his studies on the herpetofauna of Southwest Asia. This year he published the first up-to-date checklist of the Arabian herpetofauna since John Anderson's classic study of 1896. The checklist was included in a chapter he and research associate Dr. Michele Aldrich wrote as an introduction to the facsimile reprint of Anderson's *Herpetology of Arabia*. In addition, he continued as coordinator of computer services for the Academy and facilitated a record number of new computer installations in Academy departments. As executive director of the Pacific Division, American Association for the Advancement of Science, he manages the division's publications program, which currently has seven books in print and four in press, including one copublished with Princeton University Press and another with University of California Press.

Dr. Stephen D. Busack completed his year in the department as herpetology fellow, having finished six manuscripts including two review chapters for the *Handbook of European Amphibians and Reptiles*; a revision of the European and North African forms of the genera *Discoglossus*, *Chalcides*, *Blanus*, and *Macrotododon*; and ecological studies on Spanish and Moroccan lacertid lizards. He prepared his doctoral dissertation for publication in *National Geographic Research*. He also taught in the SFSU/CAS graduate course "Advances in Biosystematics."

Jens V. Vindum, Collections Manager, taught a one-semester class at San Francisco State University in herpetology, involving both lecture and field work, as well as several Academy weekend trips.

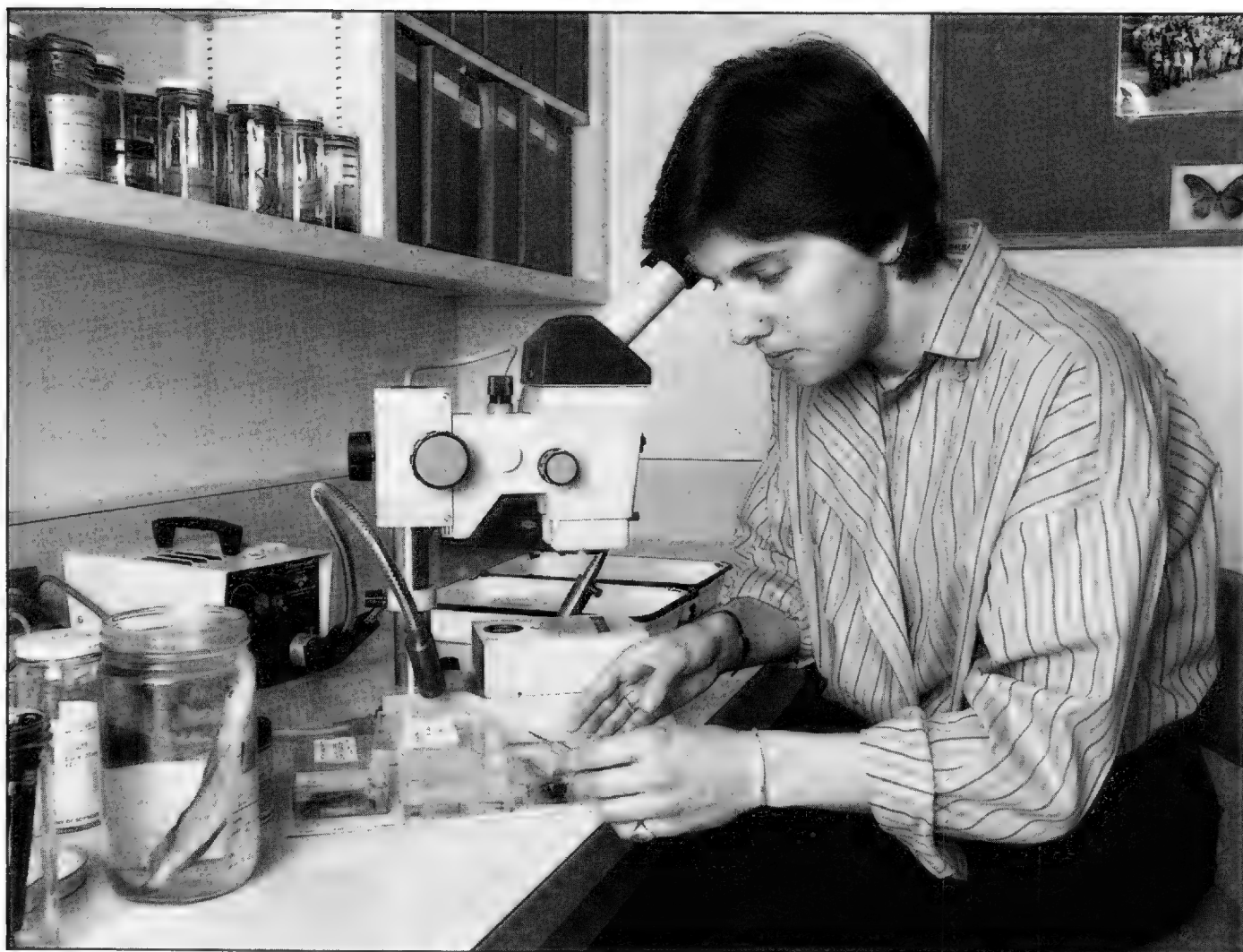
The department acquired an IBM-AT microcomputer in the spring of 1985. It is being used to prepare a catalog of type-specimens as well as for routine word processing.

Significant progress has been made during 1984-85 in converting the department's library to Library of Congress cataloging. The George S. Meyers reprint collection is being accessioned and collated with previously held reprints. Also, the department continued to sell its antique collection jars. The proceeds from these sales are used to update our collection containers and to fund future field work.



*Herpetology Associate Curator*  
**Robert Drewes**





**Ichthyology Research Biologist  
Lynne Parenti**

## ICHTHYOLOGY

Tomio Iwamoto  
*Chairman and Associate Curator*

THE DEPARTMENT OF ICHTHOLOGY continued its functions at a high pace, with the curators' time becoming more dominated by research and less by collection-related activities than in the past. The collections manager and technical assistants shared the burden of increased duties and responsibilities in day-to-day activities. Computerization of our cataloging procedures, loan transactions, and various other record-keeping and inventory processes was completed, allowing us to use our technical staff more efficiently. The collections grew with the addition of 589 accessions (2,873 specimens) from our colleagues and staff. Some of the more important included: type-specimens for fourteen new species; deep-water California fishes from M. Eric Anderson; Baja California fishes from David Catania and Lynne Parenti; Indo-Pacific reef fishes from John E. McCosker; miscellaneous California fishes representing new distributional records from Robert N. Lea; Philippine fishes from Jens Vindum; Taiwan fishes from H. Mok; and Yucatan fishes from Dale Weber.

As part of our service to the scientific community, 216 loan transactions were made, in which 6,389 specimens in 1,567 lots were shipped out. Visitor use of our collections was high: 143 researchers made 163 visits for a total of 297 visitor-days.

Seven of these scientists stayed for a week or more, including Dr. Gerald R. Allen of the Western Australian Museum, who stayed almost three months while working on a world catalog of snappers with Dr. Frank Talbot.

The National Science Foundation provided \$69,429 in the fifth and final year of a grant in support for the care and use of our collection. The grant provides salaries for two curatorial assistants and funds for collection materials and supplies.

Dr. Iwamoto continued his studies on the deepwater grenadier fishes, completing a manuscript with a Soviet colleague on the genus *Coryphaenoides* from the southeastern Pacific. He visited the Natural History Museum of Los Angeles County in conjunction with work on a catalog of the world Macrouridae and research on Southern Ocean and eastern Pacific grenadiers.

Dr. William N. Eschmeyer received a two-year grant for \$42,450 from NSF to computerize data of genera, species, and literature of fish taxonomy—this being an effective way to summarize the always-changing knowledge about kinds of fishes and their current status. As part of the project, much progress was made on the preparation of a database that will result in the publication of a "Genera of Fishes," summarizing the names and status of the approximately 12,000 generic names proposed for fishes. Drs. Joseph T. Gregory (University of California) and Reeve M. Bailey (University of Michigan) have joined him in the project. Jon Fong and Barbara Weitbrecht worked part-time on the preparation of the databases. Dr. Eschmeyer continued his studies on scorpaenid fishes, and conducted research on

caracanthids at the U.S. National Museum and the Academy of Natural Sciences of Philadelphia.

Research Biologist Dr. Lynne R. Parenti focused her NSF-funded research on anatomical study and taxonomic revision of the phallostethid fishes, an unusual group of silversides distributed throughout coastal Southeast Asia. She submitted three manuscripts for publication during the year and nears completion of a fourth, a comprehensive study on phallostethid classification. She presented seven papers at international symposia, society meetings, universities, and other museums.

Research Biologist Dr. Tyson R. Roberts departed in December for an extended collecting and study visit to India, Thailand, and Burma. The India and Burma phases of his travels are being funded by a Smithsonian PL 480 grant. He reports having made extensive collections in the state of Western Ghats (India) and peninsular Thailand. His monograph of freshwater fishes of western Borneo has been submitted for publication in the Academy's *Memoirs* series. In addition to submitting several manuscripts for publication, he had four papers published during the year.

Curator Emeritus W. I. Follett neared completion of a manuscript describing new species of pricklybacks from California. He continued his studies of fish remains from prehistoric Indian middens and of nomenclatural and taxonomic problems in zoology.

Mrs. Lillian J. Dempster worked on nomenclature and literature problems and served as index editor for the Academy's *Proceedings* as well as co-index editor (with Dr. Iwamoto) of the journal *Copeia*.

Collections Manager Dr. Stuart G. Poss focused his attention on computerizing departmental activities and overseeing most of the day-to-day activities of the department. He obtained for the American Society of Ichthyologists and Herpetologists a \$15,000 NSF grant to send U.S. participants to Tokyo to attend the second International Conference on Indo-Pacific Fishes.

Dr. M. Eric Anderson received a contract from the Smithsonian Oceanographic Sorting Center to conduct research on deep-sea eelpouts of Antarctic waters. He made cruises off California with researchers from Scripps Institution of Oceanography to collect deep-sea fishes and dove to more than a mile deep in the submersible *Alvin* during a cruise of the Woods Hole Oceanographic Institution vessel *Atlantis II*.

Mr. David Catania took time off from his curatorial assistant position to make two trips to Baja California with the Invertebrate Zoology staff to collect fishes for our department.

# INVERTEBRATE ZOOLOGY AND GEOLOGY

Peter U. Rodda,  
*Chairman and Geologist*

UNDER THE SUPERVISION of Robert Van Syoc, Collections Manager, 4,000 specimen lots of living invertebrates were received in 215 accessions; 12,000 lots consisting of about 60,000 specimens of recent invertebrates and fossils were cataloged during the year. Significant accessions include material collected by: Dr. A. J. Ferreira from the Cocos Islands, the Gulf of California, and Thailand; CAS-IZ expedition collections from Baja California which include several new species of nudibranchs, sponges and barnacles; the Channel Islands Research Program cruises on which CAS-IZ staff took part yielded hundreds of valuable specimens including possible new species of chitons, sponges, and a new species of opisthobranch; cruises on the research vessel *Cayuse* out of Moss Landing with CAS-IZ staff collected several very rare species of deepwater invertebrates.

The department received another portion of the best Galápagos fossil collection assembled when it accessioned material collected by William Pitt, Carole Hickman, and Jere Lipps.

Margaret Hanna continued to care for the large diatom collection. Cataloging of the large A. L. Brigger slide collection, and other units of the diatom collection, has accelerated due to the use of a microcomputer system developed by Dr. Michael Hoban, Tilton Postdoctoral Fellow. An outstanding gift of a diatom library was received from the estate of Robert I. Firth, Seaford, England. Dr. S. L. Vanlandingham donated 1,008 diatom slides from various localities.

Jean DeMouthe continued to supervise the mineral collection, which now contains 13,869 specimens; 2,236 specimens were donated during the year. Noteworthy donations include specimens from Dr. Julian Hoffman, A. L. McGuinness, Jack Halpern, Jean Mager, and Gladys Walker. A gift of thirty-one naturally colored diamonds was received from Rainbow Gems International. The California State collection of native gold and other precious metals was received on loan. This important collection will be the basis of an exhibit on California gold which will open in August 1985. The exhibit is

**Geology Field Associate Clarence Schuchman preparing a 90-million-year-old ammonite fossil**

made possible by a gift of \$5,000 from Homestake Mining Company.

Loans of 1,550 specimens of living invertebrates, fossils, diatoms, and minerals were made in 115 separate transactions. The two departments received approximately 150 visitors during the year. Major construction work involving our new compactorized shelving units prevented many scientists from making study visits.

Amelie Scheltema, of Woods Hole Oceanographic Institute, visited for a week to study our collection of aplacophoran mollusca. Eugene Kozloff, from the University of Washington, visited for a week to study our collection of Recent invertebrates and to consult with staff concerning a new edition of his identification keys for marine invertebrates

of the Pacific Northwest. Eveline Marcus, of the University of Sao Paulo, Brazil, visited to consult with Terrence Gosliner on opisthobranch systematics.

The National Science Foundation provided \$193,000 for support of collections through the third year of the three-year grant for the mollusk collection, and the first year of a five-year grant for compactorization of the fossil and modern invertebrate collections. The mollusk grant provides salaries for curatorial assistants and funds for supplies and equipment. The compactor grant provides funds for compactor equipment.

A nine-month contract from the U.S. Corps of Engineers to evaluate the paleontological resources of two proposed reservoir sites in the northwestern Sacramento



Susan Middleton



Valley, California, was completed, and a draft final report submitted for approval. The report identified and evaluates affected areas and makes recommendations for mitigation or salvage. Dr. Peter Rodda is project director.

Department staff continued to be deeply involved with exhibit development. Jean DeMouthe was in charge of the new Earth and Space Hall, which opened in October. Dr. Peter Rodda is curator of the planned Hall of Life Through Time, which will present an array of displays relating to the origin and evolution of life. The department staff also taught Docent, Adult Education, and Junior Academy courses, led field trips, and assisted other institutions and the public.

Dr. Daphne Fautin continued her research on sea anemones and attended a coral reef symposium in Tahiti. For part of the year Dr. Fautin was a visiting professor of biology at Beloit College, Wisconsin, and in June she taught a summer course at Bamfield Marine Station, British Columbia.

Dr. Michael T. Ghiselin continued his work on evolutionary biology and on Darwinism. He conducted field work in Tahiti, the Caribbean coast of Mexico, and Baja California. Dr. Ghiselin delivered a number of papers at international, national, and local meetings. During summer 1985 he served as

a visiting professor at the University of Pavia, Italy.

Dr. Terrence Gosliner continued his studies on the systematics and evolution of opisthobranch mollusks, with emphasis on species from Southern Africa and Mexico. His field work in Baja California and the Caribbean coast of Mexico resulted in the discovery of several new species. During the year he attended scientific meetings in Denver and Washington, D. C.

Dr. Michael Hoban, the Tilton Postdoctoral Fellow, joined the staff in August. He has been investigating the morphology and systematics of Cretaceous fossil diatoms, among the earliest known. He also cloned modern diatom species and examined life histories. Dr. Hoban designed a microcomputer cataloging and database management system now in use for the diatom collection.

Dr. Welton Lee continued his research work on California sponges, with special interest in the biochemical systematics of haplosclerid sponges. He conducted field work in central California, Baja California, Vancouver Island, British Columbia. He visited major sponge collections and sponge specialists in the United States and Canada, and he presented an invited seminar at Washington State University.

Dr. Peter Rodda continued his study of

Cretaceous and Neogene mollusks of northern California. He conducted field work in the Cretaceous rocks of the northwestern Sacramento Valley. He served as a coleader of a field trip along the San Mateo coast for the Society of Economic Paleontologists and Mineralogists, and he presented a paper on vertebrate fossils from San Francisco at a scientific meeting in Vancouver, British Columbia.

## ORNITHOLOGY AND MAMMALOLOGY

Luis F. Baptista  
*Chairman and Associate Curator*

DR. BAPTISTA continued long-term collaborative studies with Dr. Martin L. Morton on song dialects of montane white-crowned sparrows at Tioga Pass in the Sierra Nevada, and with Dr. Barbara B. DeWolfe and Dr. Lewis Petrinovich on song development of coastal white-crowned sparrows. Dr. Gopi Menon returned from India for a two-month visit to complete studies with Dr. Baptista on cutaneous water loss in desert finches.

Dr. Baptista lectured at the annual meeting of the American Ornithologists' Union at Lawrence, Kansas. He delivered invited lectures at the University of California, Los Angeles, and Santa Cruz campuses, the University of California Bodega Marine Lab, and Sonoma State University, among others. Dr. Baptista led an Academy trip to the Trobriand Islands, Sepic River, and highlands of New Guinea.

Senior Scientist Dr. Robert T. Orr continued to serve as chairman of the Academy travel committee, and he led an Academy trip to Indonesia. The Docent course again was coordinated by Dr. Orr.

Dr. Pepper W. Trail and field assistant Linda Dallago spent two months in Surinam furthering his research on Guianan cocks-of-the-rock and calfbirds. Dr. Trail obtained a two-year NSF Postdoctoral Fellowship to continue this work, based in our department.

Jacqueline Schonewald retired after twenty-eight years of outstanding service to the Academy. She received special recognition for her performance and for her contribution to marine mammal conservation from the CAS Science Council and from the Sequoia Audubon Society. She has graciously volunteered her time to help the department after her retirement. Her research on



*Invertebrate Zoology Assistant Curator*  
**Terrence Gosliner**



**Ornithology and Mammalogy Collections  
Manager Stephen Bailey with Secretary  
Maima Te'o**

elks with Drs. Christine Schonewald-Cox and Jonathan Bayless is continuing.

Dr. Stephen F. Bailey joined the department as its first collections manager. Since 1980 he has been directing the research and management of the northern California population of the endangered California least tern. He continues to compile and publish monthly reports of all central California bird observations, a position he assumed in 1978. Dr. Bailey also became a regional editor for the journal *American Birds*.

Betsey D. Cutler eased the transition in collection management before rejoining our staff as a specialist in repairing our heavily used Darwin's finch skins. Lise Thomsen and Mary Marcussen continued to perform valuable curatorial services. Dianna Stammerjohn transferred to the Education Department, and the department's secretary position was filled by Maima Te'o.

The National Science Foundation awarded the department a three-year grant totalling \$199,255 for enhancing the curation of the bird collections and computerizing all their specimen data. Four people have joined the staff on this grant: Betsey D. Cutler, Sylvia Hope, Linda Dallago, and James P. O'Brien. Besides the repair of the Galápagos and Philippine collections, this project supports cataloging and integration of two major collections. The 637 birds of the Oaxaca, Mexico, expeditions were cataloged. The Stanford University Collection of more than



13,000 birds was made ready to be cataloged.

The California Bird Records Committee designated the department as the official repository of sound recordings of rare birds in California.

We added 94 accessions to our holdings, and cataloged 892 individual birds and mammals. Dr. Bailey collected 59 fork-tailed

storm-petrels found dead on Monterey Beach.

We sent out 23 loans of 189 mammals, and 116 birds in 14 loans. Loans returned during the year totalled 97 mammals in 25 transactions, and 109 birds in 15 loans.

About 990 visitors totalled 1,115 visitor-days, for an average of 93 visitor-days per month. Contributing to this rate were 474 people in 28 organized groups, mostly classes. Professional scientists numbered 112, for 180 visitor-days. Fifty-three graduate students visited 113 days. Thirty-nine government officials and 41 representatives of other institutions also used the department.



## SCIENTIFIC PUBLICATIONS

Daphne G. Fautin  
*Scientific Editor*

THE SCIENTIFIC PUBLICATIONS department underwent further transformation this year. Dr. Daphne Fautin accepted appointment as scientific editor, assuming chairmanship of the publications committee and undertaking all major tasks related to reviewing and accepting manuscripts.

**Scientific Publications editors Daphne Fautin and Sheridan Warrick with Anthropology Research Associate Diane Carroll**

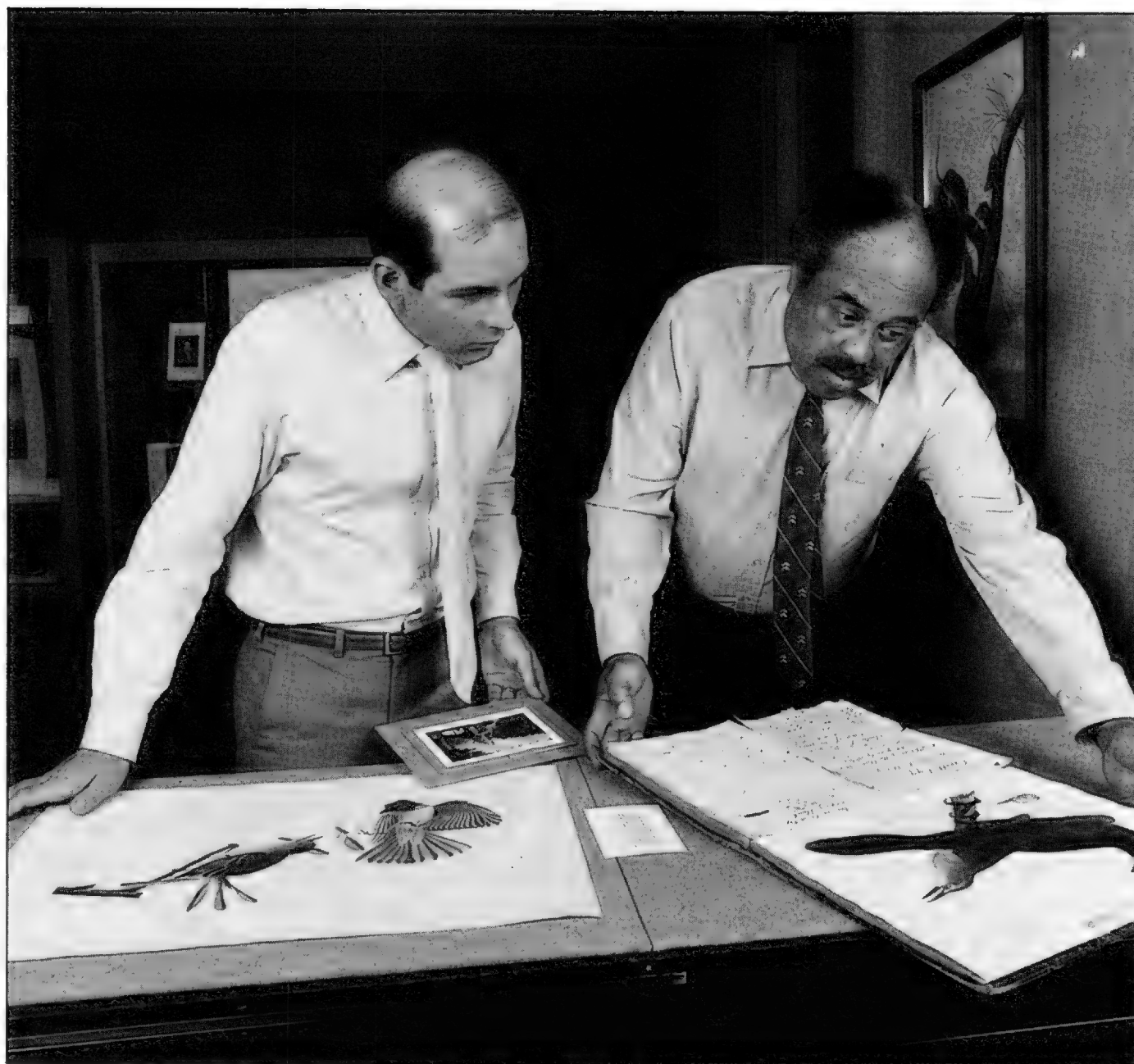
**Acting Librarian James Jackson and  
Assistant Librarian Richard Palowick**

Sheridan Warrick returned to his former role as managing editor, overseeing copy-editing, production, distribution, and subscriptions. After Mary Stilwell left the department, Katherine Ulrich was hired as publications assistant and now handles most copy marking, proofreading, mailing, subscription renewals, and back-issue sales.

Since the last annual report eight issues of the Proceedings and two volumes of the Occasional Papers have been published, totaling 303 pages.

Academy scientific publications are mailed to approximately 850 individuals and institutions in the United States and abroad.

Members of the Scientific Publications committee were Frank Almeda, Daphne G. Fautin, Tomio Iwamoto, Wojciech Pulawski, Frank H. Talbot, and Sheridan Warrick. Lillian J. Dempster served as Proceedings indexer.



## LIBRARY

James Jackson  
*Acting Librarian*

WITH THE MOVING of the picture collection to the mezzanine of the library, all of the Academy's library research facilities are now focused in one location. Johan Kooy has taken over as part-time archivist and with the help of able volunteers has changed the mezzanine into a functioning part of the research operation.

The OCLC M-300 computer became fully operational in May with the installation of a modem and a dedicated phone line. We now share library resources with thousands of libraries in the U.S., Mexico, Canada, and Europe and we can access any online database. Ruth Oppen, Richard Palowick, and James Jackson all attended training sessions on specific computer applications. We are now operational with computerized cataloging, interlibrary loans, and database searching. Software has been ordered for circulation control and serial check-in, and plans are being made for budget applications. Assisting with the Library of Congress conversion project are two students from the City College Library Technology program. We have just finished reclassifying the herpetology

Library and have Mammalogy & Ornithology, Entomology, and Ichthyology to complete before all the departmental libraries are reclassified.

In May the library was host for the annual meeting of the Science and Engineering Academic Librarians, a division of the California Library Association. The theme of the program was "Bringing Science to the Public." Speakers were Richard Harris, Science Editor of the S. F. Examiner, and James Jackson of the Academy. Richard Palowick was elected a member of the Northern California Technical Processing Group's nominating committee and James Jackson continued to serve on the board of directors of the City College Library Technology Program.

Dr. Herman Speith, Professor Emeritus of Zoology, UC Davis and an Academy Fellow, donated his personal library to the Academy. The Library celebrated John James Audubon's two hundredth birthday with a special exhibit of some of the library's Auduboniana, which was also on display for the annual open house. Some significant purchases were *The Native Orchids of Brasil* by Dias et al., *The Geological Atlas of the World*, *Fishes of the Japanese Archipelago*, and the Campbell and Lack *Dictionary of Birds*.

The Associated Natural Science Institutions libraries cooperated on two proposals for funding during the year. One would sup-

ply funds to preserve and microfilm periodical holdings and the other would organize and preserve archives. The results are still pending.

Approximately 1,700 books and serials were added to the catalog this fiscal year. This number reflects increased efforts to create on-line serials records to enhance interlibrary loan activities.

## ARCHIVES

Johan Kooy  
*Archivist*

The archives were reorganized in November 1984, and much has been accomplished. Office space was expanded to accommodate more assistants, the entire archives was cleaned, shelving was reorganized, and archival collections were moved into new alphabetical sequences.

The two most significant additions to the Archives during this period are the Rollo Beck Collection of Galápagos and South Pacific material, circa 1905–1927, donated by Don and Polly Fellers; and an important record of the Academy's financial life in ledgers and record books dating back to 1906 turned over to this department by Nancy Dykes, director of administration. Archival assistants James Fidiom, Howard Jones, Ann Preece, and Cecil Reichert helped significantly in this period of reorganization.



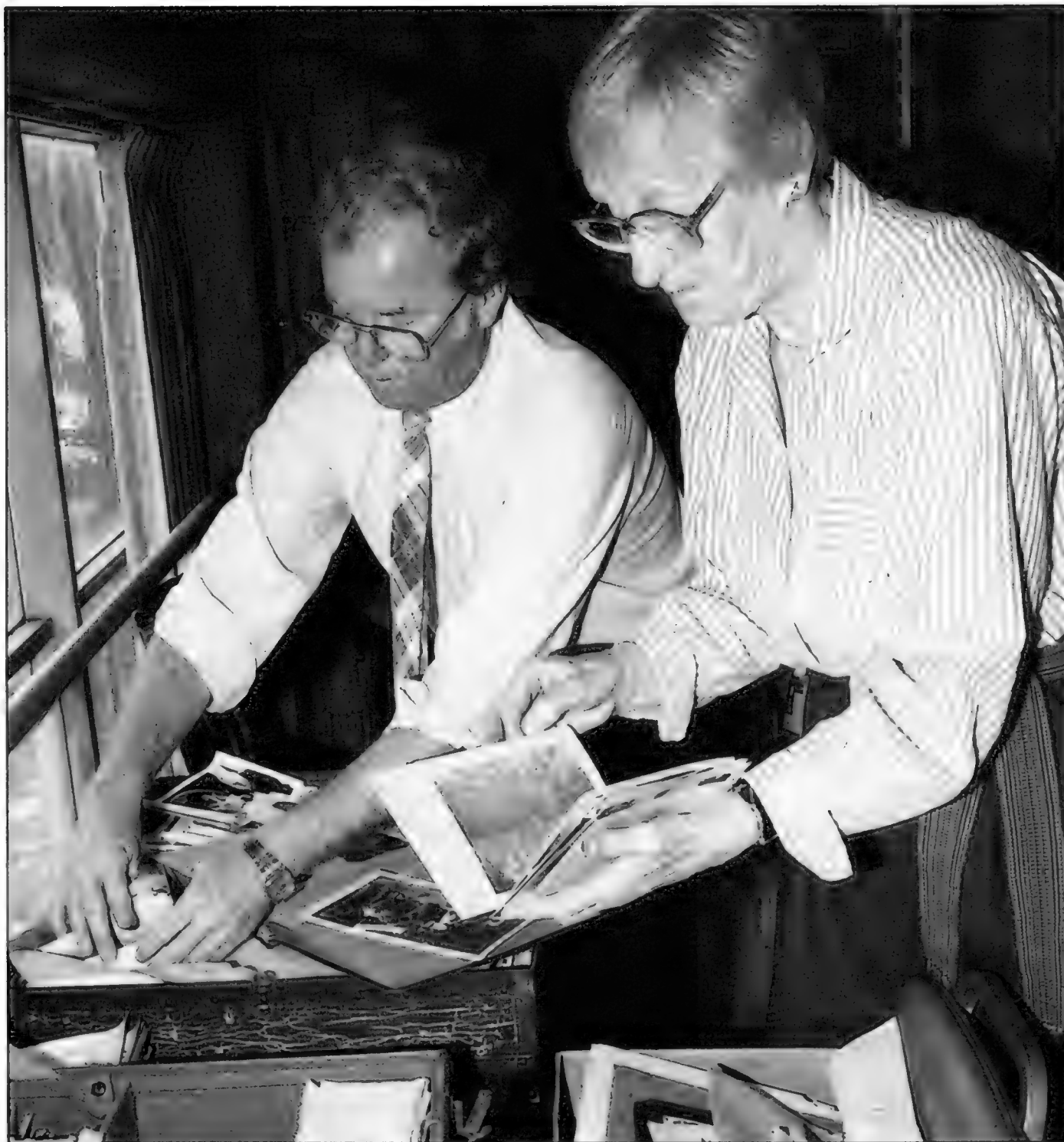
*Picture Collection Chairman Johan Kooy  
and Associate Cecil Reichert*

## PICTURE COLLECTION

Johan Kooy  
*Chairman*

**D**URING THE PAST YEAR, the Picture Collection moved from its quarters in North American Hall into new offices in the upper level of the Academy's library building. Though still maintained as a completely separate department, the Picture Collection gained a beneficial proximity to the library, as functions and clients of both departments occasionally overlap. Mr. Kooy is also in charge of the Academy's Archives, adjacent to the Picture Collection.

Increased volunteer assistance during the period of change reflected the workload of this growing department. Moving over a million pictures and restoring their order in new quarters taxed staff ingenuity and endurance but also enabled logical reorganization of collection storage and work areas.



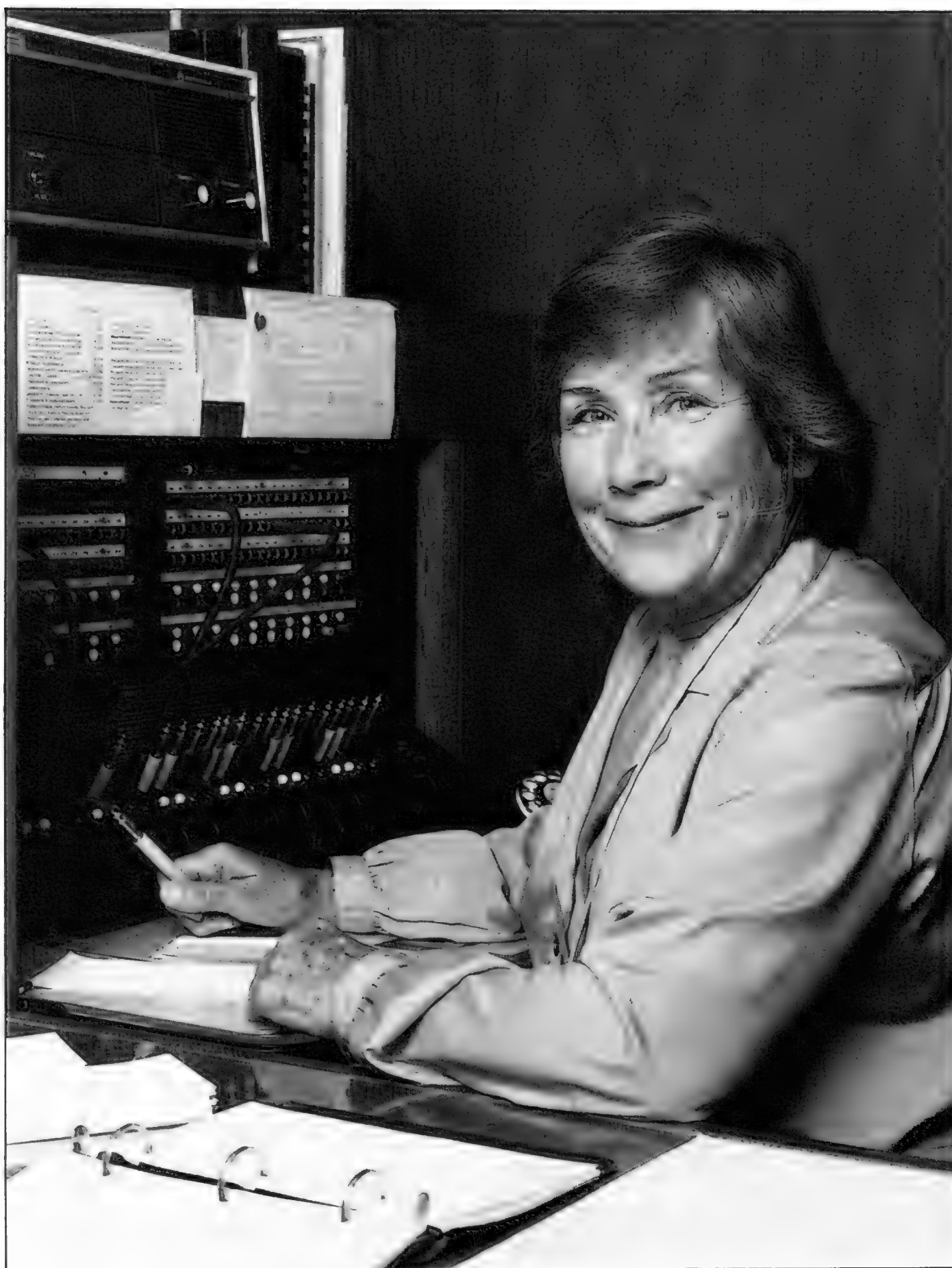
*Rollo Beck collection materials  
now in the Archives*

# ADMINISTRATION

**Nancy B. Dykes**  
*Director of Administration*

THE TASK of keeping the Natural History Museum and Aquarium healthy and functional is the responsibility of the dedicated employees of the Administrative Division. The guards who secure life and property; the custodians who keep the complex clean and enjoyable; the admissions personnel who greet our 1.5 million visitors; the office staff that pay the bills, answer the phones, deliver the mail, and provide service to our 250 employees; and the operations staff who provide technical support for all capital and construction projects—all are crucial members of the division workforce.

This fiscal year saw a consolidation and improvement of systems implemented in the previous year. The Personnel department continued to mature into its increasingly important role in the institution. Payroll responsibilities were transferred to the Business Office, freeing Personnel staff to concentrate on computerizing and streamlining the department's burgeoning records concerning salaries, vacations, grade and step status, benefits, and other details for each staff member. Meanwhile, Business Office staff further improved the complex computerized systems for maintaining accounts payable and receivable and for reporting to department heads on their expense records.



## BUSINESS OFFICE

**Jane Yau**  
*Controller*

FOR ONE MONTH, beginning in December, 1984, the Business Office was transplanted into temporary quarters in the Trustees' Room. The staff returned to a remodeled, partitioned office. The new layout has alleviated the previous problem of noise pollution and production has improved as each staff member enjoys privacy within the work area.

This was only the third year that the computer service bureau system has been in use, but the Academy's growing pains continued to be felt. The Business Office has prepared, under Dawn Davis's supervision, to convert from a batch system to remote data entry. The objective is to improve control over data input and to speed the turnaround time. Funds permitting, the plan is to have a system with software sophisticated enough to provide on-the-spot updates on all accounts and to interface with the Development, Admissions, and Membership department.

During the year the Business Office absorbed all payroll functions, previously a responsibility of Personnel. Ivan Wong came on as part-time payroll clerk and has been putting his computer expertise to work.

Late in the year the staff was involved in converting the Academy's accounts from Crocker Bank to Bank of America. Davis and John Cienna cleared the backlog of bank reconciliations, enabling the conversion to happen.

**Telephone Operator and Receptionist**  
**JoAnne Deasy**

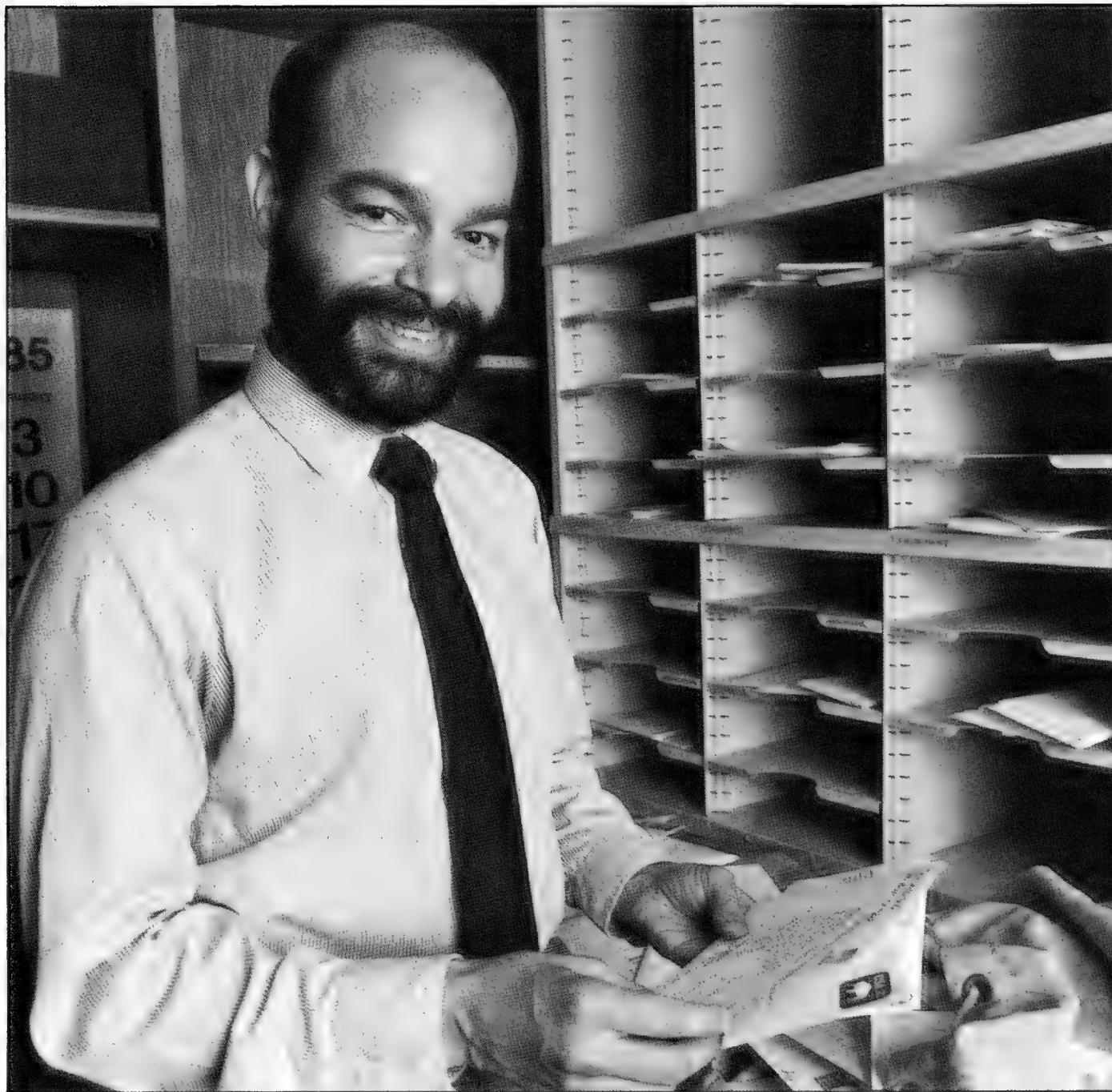


## PERSONNEL

Joan. S. Hall  
*Senior Personnel Assistant*

FOLLOWING its formal establishment as a regular department in the 1983-84 fiscal year, the Personnel department continued to solidify its role in the institution. With the cooperation of the department a major review of the Academy's wage and salary structure was conducted by the Wyatt Company, culminating in several significant revisions to the grade and step structures and in some strongly justified reclassifications of staff positions.

Within the department many changes were made during the year. Among many other activities, office records for benefits, salaries, and vacations were computerized. On 19 February 1985 Laura Outsen was hired as temporary personnel assistant, and on 5 March 1985 Senior Personnel Assistant Joan Hall resigned from the department. From that date Laura Outsen served as acting personnel manager through and past the end of the fiscal year.



## ADMISSIONS

Tina M. Ahn  
*Admissions Supervisor*

THE ADMISSIONS DEPARTMENT is responsible for the single largest revenue source for the Academy's operating fund. This year our cashiers and ticket takers welcomed 1,472,172 visitors to the Natural History Museum and Aquarium. This figure represents a slight decrease in attendance of 0.2 percent. Paid attendance decreased 3.6 percent, but non-paid attendance—which includes members and their guests, children under six years of age, and San Francisco school groups—increased 8.4 percent.

The responsibilities of cashier and ticket taker were fulfilled by a staff of thirty-six in 1984-85. The Admissions staff greet visitors and provide information on Planetarium show times and exhibits within the museum.

## PACIFIC DISCOVERY

Sheridan Warrick  
*Editor*

THIS YEAR the Academy's quarterly magazine published more than thirty major articles on animal behavior, ecology, evolution, and astronomy, among many other topics. Authors were professional writers and scholars from around the nation.

In January 1985 we began publication of a series of trenchant articles on the creationist movement and its impact on the teaching of science and on the public perception of scientific truth. Painstakingly investigated and written by Academy research associate William J. Bennetta, these articles brought the institution's commitment to legitimate science education to the attention of scientists and policy-makers nationwide and prompted a strong, positive response from the magazine's

readers. Likewise, Jerold M. Lowenstein's insightful column *Counterpoints* in *Science* drew favorable letters from many readers.

Graphic artist Dustin Kahn was brought on during the year as Designer, and Johan Kooy left his position as Art Director to become Photography Editor. Katherine Ulrich, hired during the year as Publications Assistant, assists with retyping of accepted manuscripts, filling of single-copy orders, and dispensation of fees to authors and photographers, among other tasks. Associate editors are Robert I. Bowman, John E. McCosker, and Robert T. Orr. Executive Director Frank H. Talbot is Publisher *ex-officio*.



*Business Office Bookkeeper Alice Chu*

## OPERATIONS

Frank DeOme  
*Operations Manager*

ALL ASPECTS OF THE MUSEUM, including scientific research and public programs, rely on Operations for plant services, technical design, engineering and implementation, as well as repair of equipment, installation and fabrication of new equipment, minor renovations, remodeling, and major new construction. The Instrument Shop, Security, Custodial, and Print Shop departments all fall under the jurisdiction of Operations.

This year in addition to overseeing the management of these departments, Operations staff also participated and contributed to many Academy projects:

A four-and-a-half-year project was completed this year. All of the blueprints for the various Academy buildings are now stored on microfilm, and copies can be made on the Operations' microfilm machine. This project involved an exhaustive search throughout the Bay Area for blueprints and drawings dating back to 1908. The drawings have now been organized, indexed, and put on microfilm. The originals have been placed in the Academy archives.

In April on "Earthquake Day" the Academy had its first earthquake drill, organized by Pam Wing of Public Information with the assistance of Nate Cole of Operations. Nate has now gathered various emergency preparedness equipment, which is now available. A vapor degreaser was installed on the roof of the Academy for Ornithology & Mammalogy. In the Geology Department the first elements of a shelving compactor system were installed. Operations personnel have assisted in both the design and implementation of this major department reorganization. New carpeting was installed in the Aquarium, Earth and Space Science Hall, and Lovell White Hall. Early this spring, major fumigation was carried out in Ornithology & Mammalogy.

The Operations manager worked closely again this year with architects, engineers, and contractors during the remodeling of the cafeteria, planning for reroofing projects and seismic upgrading of North American Hall.

There have been personnel changes this year. Robert Ayala now paints for the Aquarium, and Greg Scharf paints for Exhibits. Eric Dale is now the part-time painter for Operations. Eric painted various hallways, offices, and workspaces at the

## PUBLIC INFORMATION

Pam Wing  
*Public Information Officer*

IF ONE WORD could describe this year, "diverse" would be the one. In a twelve-month period the Public Information Office has worked on projects ranging from an earthquake simulator display to dinosaurs, from rare and endangered plants to Olympic champions.

The Public Information Office is responsible for the coordinating and disseminating of information to the public on the institution's many programs and research activities. The most visible results of this work appear in newspapers and magazines, on television and radio programs, and involve members of the museum staff as well as distinguished visitors.

Many special exhibits and events attracted media attention including "Circles of the World: Traditional Art of the Plains Indians" and the opening of Earth and Space Hall, featuring the "Safe-Quake," a ride that simulates two of California's famous tremors.

With the expertise of the KGO-TV public affairs department, a thirty-second public service announcement helped launch the opening of Earth and Space Hall. KRON-TV worked once again with the Academy in its annual "Photography Contest for Young People." Macys became an early and enthusiastic supporter of DinoFest '85 by committing their advertising space to the project.

In addition to working with media, the office continued produce the monthly *Newsletter*, with information especially for members, and originated a variety of brochures and publications including *The Dinosaur Times*, written specifically for DinoFest '85.

Jerry Kay, producer of the Academy's radio program "Science In Action" has been constantly on the go, searching out interviews for this daily radio program aired in several California markets.

Carol Prince, in addition to her role as Assistant Public Information Officer, is responsible for the on-site version of "Science In Action" in which museum staff take to the microphone at 1:30 each weekday to describe research activities at the museum.

The year's public information function could not have been accomplished without volunteers Robert M. Dunne and Harriet Weller.

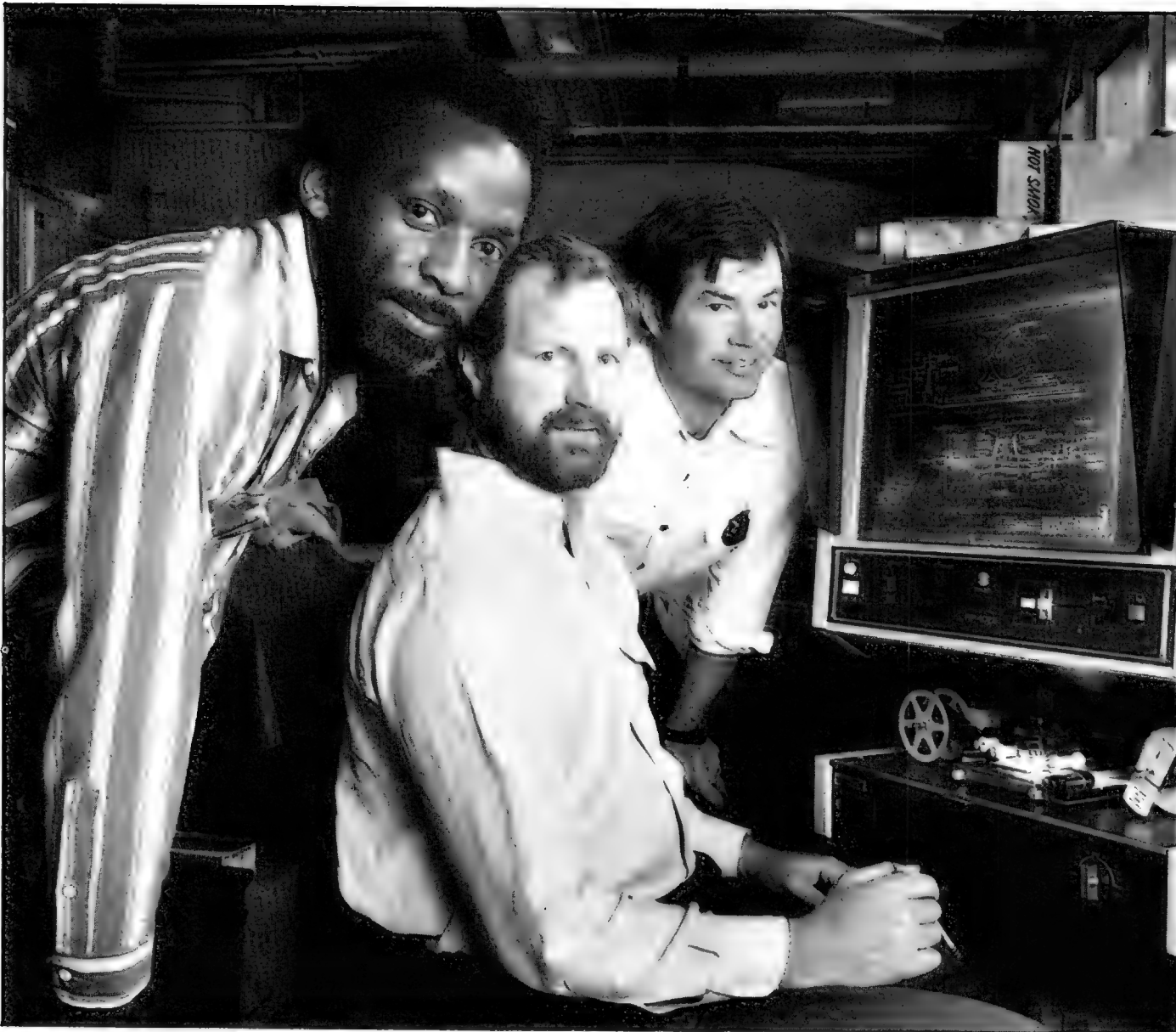




*Public Information Officer Pam Wing and Assistant Carol Prince with KGO-TV cameraman George Lang*



*Assistant Head Guard Jim Murphy*



*Assistant Operations Manager Nate Cole, Chief Engineer Joe Brennan, and Operations Manager Frank DeOme*

## SECURITY

Levelle Alderson  
*Head Guard*

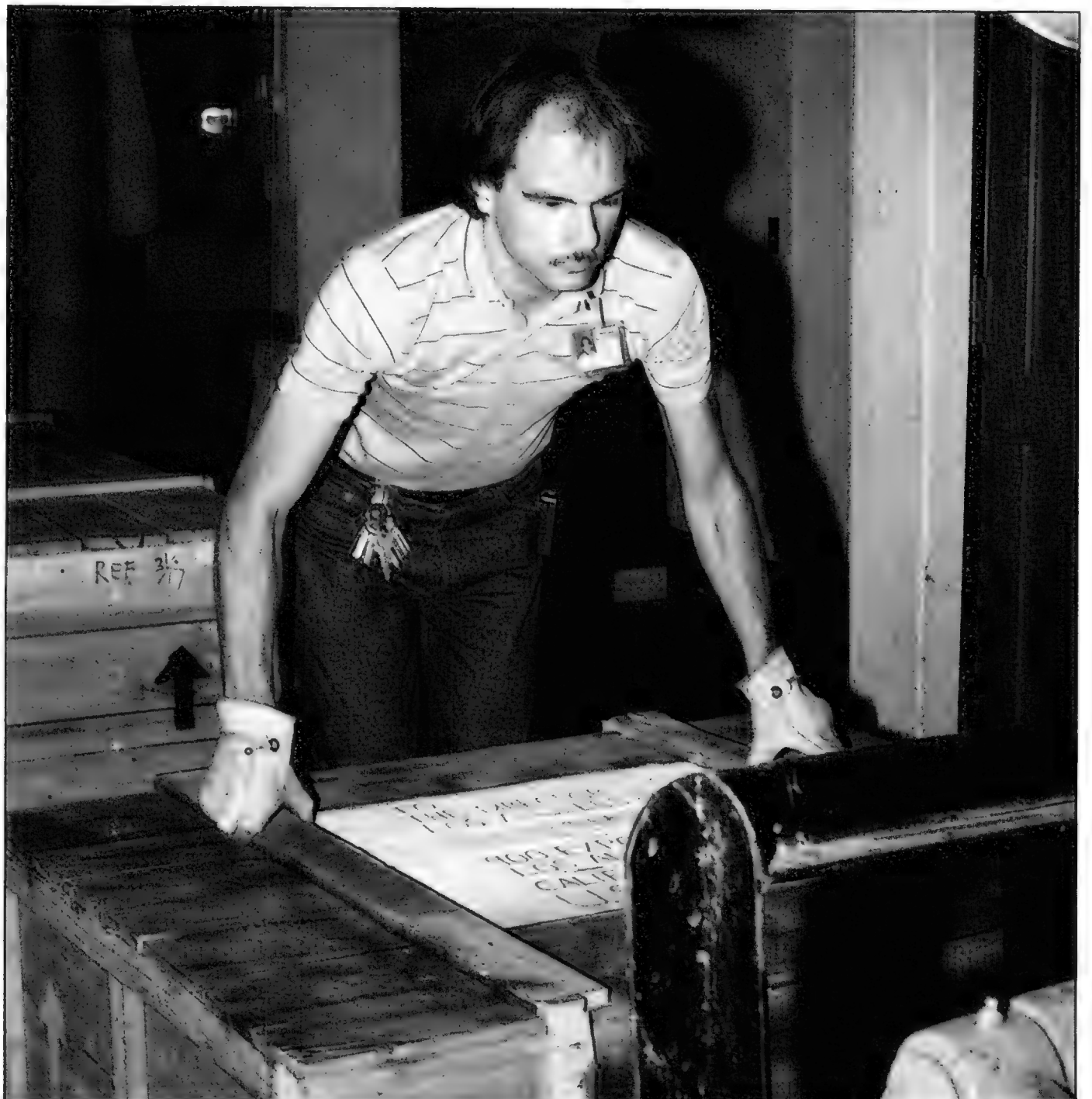
It is the responsibility of the Security staff to provide full security for the visitors, staff, and property. Special exhibits containing valuable art work, artifacts, and treasures require monitoring of surveillance equipment and alarm systems by the guards.

The guards also give information to the public, register school groups, and help locate people lost in the building. All guards are properly attired. The guards are the first and last staff members that the public sees and their dress and manner leave a lasting impression on the public.

Levelle Alderson, as Head Guard is responsible for the supervision and scheduling of the guards.

Academy as well as at Hannan House and the Commercial Building. Jeff Kohl took Gil Fuller's position as electrician when Gil left for Exhibits. Jeff, who left the Academy in May, also worked on the blueprint project, repaired Admissions ticket machines and cash registers, and did various other tasks. Lonner Holden worked for Operations keeping the building in good repair from the roofs to the basement. In April the Commercial Building hired a full-time maintenance technician, Ron Carswell, allowing Lonner to spend more time at the Academy.

Volunteer Rich Kerrer lent his electrical engineering expertise to help review the capacity of the main electrical switchboard and the method for installing emergency generators in the Aquarium.



*Maintenance Supervisor  
Daniel Langlands*





**Entomology Curatorial Assistant and  
Print Shop Binder Stella Tatro**

## INSTRUMENT SHOP

Cary Ponchione  
*Supervisor*

Projects this year included:

- Installation of the shake table exhibit in Earth and Space Hall. The design and building of the control system for the shake table was done by Cary Ponchione, Tom Henry, and Wayne Lunden. To lessen the noise created by the pump, the system was moved to the courtyard area.
- Design and construction of special projectors, by Cary Ponchione and Tom Henry, to light the planets in Earth and Space Hall.
- Design and construction of an electric breaker tracer machine by Larry Klingenberg.
- Design and construction of a recording delay system for use in a bird linguistics project for Luis Baptista by Wayne Lunden.
- Installation of a new banner hanging system for the front entrance of the Academy by Cary Ponchione and Tom Henry.
- Repair of approximately seventy microscopes by Tom Henry.
- Construction of approximately twenty-five armatures for the costumes and mannequins for the "Circles of the World" exhibit by Cary Ponchione.

Approximately 500 purchase orders and billings were handled by secretaries Pat DeOme and Eileen Protz, who share a position serving both the Instrument Shop and Operations Department. They handle up to sixty incoming telephone calls per day and act as liaison with the telephone companies to handle all Academy telephone needs.

Two Foucault pendulums were built and installed this year: one, at Cumberland Museum in Nashville, Tennessee; a second, at Berea College, Berea, Kentucky by Cary Ponchione.

Repairs of the public address systems around the building and new equipment installations of sound equipment were handled or supervised by our volunteer, Harold Wollenberg.

Countless furniture and rail guard repairs were made by Herbert Hoover, who also helps to keep the shop supplies and tools in order.

## CUSTODIAL

Daniel Langlands  
*Maintenance Supervisor*

It is the responsibility of the Custodial staff to keep the public and department areas clean. The public areas are open to visitors every day of the year, requiring daily custodial service. Daniel Langlands, Rosa Ortiz, and J. Antonio Bertolazzi, along with relief custodians Perry Bradstreet, David Alvarado, and James Treat, fulfill these duties.

Besides general clean-up throughout the building, the custodial crew assists in preparation for new exhibits. Also, the crew is responsible for moving furniture and equipment. Our biggest achievements this year in this area was moving the Anthropology Department and Business Office into temporary facilities until the renovations of their departments were complete. The picture collection files, which were located in North American Hall, were moved into permanent quarters in the Library.

The custodial staff were busier than ever this year off-loading shipments and deliveries at the Academy's loading dock and

providing assistance at the Academy's growing number of special events.

Every evening, a private maintenance company, Pedus, performs a major cleaning function in the public and departmental areas. Mr. Langlands supervises the operation and coordination of the evening crew along with Faustino Alvarez, foreman for the Pedus crew.

## PRINT SHOP

Frank DeOme  
*Operations Manager*

The Academy's in-plant print shop was originally started in the early 1950s as part of the Instrument Shop's efforts to have in-house printing of scientific publications and staff use printed material. Bob Dueball, our printer, has been able to keep up with an expanding work load. This is accomplished with the help of the upgraded multilith press put into service in 1983-84. Stella Tatro, our binder, does most of the folding, stapling, and trimming.

# PEPPERWOOD RANCH NATURAL PRESERVE

**George E. Lindsay**  
*Director*



Lloyd Ullberg



Lloyd Ullberg

PEPPERWOOD RANCH Natural Preserve's nearly five square miles of natural habitats in Sonoma County were the subject of an intensive management study by consultant Betsy Jewett Coombs during the year. Her resulting report and recommendations are directed toward accomplishing the preserve's most important objective, saving an undisturbed sample of central coast range wildlands for the future and for compatible educational and research activities.

One desirable educational asset anticipated since the founding of the preserve was an astronomical observatory. Through the generosity of Trustee and Mrs. William J. Hume, an observatory building was designed and constructed on a low hill south of the taxidermy studio. It is an inconspicuous structure, with a sliding roof rather than a dome. Electric, water, and telephone services are underground, and during their installation existing power and telephone lines between the caretaker's house and taxidermy studio were also buried. Telescopes and observing equipment long owned by the Academy's Planetarium will be installed in the Hume Observatory, whose management and operation will be the Planetarium's responsibility. Steven B. Craig, Chairman of the Planetarium, Leon Salanave, Planetarium Associate, and Fred Funk, Resident Supervisor of Pepperwood Ranch Natural Preserve were active participants in the Hume Observatory project.

The taxidermy activities of the Academy have been centered in a converted barn and equipment building at Pepperwood. This facility permitted the construction of bulky exhibit units and other activities not possible at the museum. Taxidermy classes and apprentice programs have also been conducted there. The Academy has discontinued taxidermy and the studio building at Pepperwood is now unused. The practicability of converting it into a Visitor's Center is being investigated.



# DEVELOPMENT

**Charles B. Raaberg**  
*Director of Development*

**T**HIS HAS BEEN a satisfying year. Gift results are up impressively; past gains in membership are being consolidated at the 20,000 mark before forging ahead; plans for capital fundraising are being initiated; and the staff from the various units of this division have finally worked together as a team for a full year.

In the past twenty-five years, gift results have spiked three times. This year will be the fourth time; gift dollars received by the Academy have tripled since last year, from \$1.07 million to \$3.30 million. The reasons are two: first, \$1.35 million has been paid toward pledged commitments for the master plan capital program; and second, a bequest of \$761,000 was received from the Ernest C. Mailliard estate. Mr. Mailliard first joined the Academy in 1911, and his interest apparently never flagged.

Riding a spike is exhilarating on the up side, depressing on the down side. We hope to avoid coming down too far this next year by working to produce more consistent gift results. Last year gift

levels advanced twenty percent over the year before, even after we deduct the large bequests and special capital gifts. If we can continue to make such substantial gains in our basic support, then the Academy will be preparing solidly for the future.

Unrestricted giving is an area where much improvement is needed to support an institution growing in professionalism and complexity. In the coming year, we will be seeking ways to increase gifts to be used where the need is the greatest.

In the reports that follow from Membership, Travel and Special Programs, and Special Events, there is a sense of a vibrant Academy—old in tradition, but still young enough to try new ways of doing things. Trustees, staff and volunteers are dedicated and committed to the goals of the museum. The future is bright for all of the outreach programs.

See pages 33 through 35 for details on 1984–85 donations from individuals, corporations, and foundations.

## MEMBERSHIP

**Alice H. Franco**  
*Membership Coordinator*

**T**HE ACADEMY'S MEMBERSHIP grew only slightly this year from 20,389 to 20,593 members, but income from membership grew twenty percent from \$448,314 to \$565,693 due to an increase in membership fees on 1 August 1984. A membership mail campaign in the spring of 1985 brought in more than 1,000 new Academy members.

In 1984 the Academy conducted a survey of its members and discovered that they are well educated, relatively affluent, and mostly over thirty-five. Many members have children. Members are active participants not only in Academy activities but also in other non-profit organizations. They enjoy a wide variety of sports and hobbies. Free admission is still the favorite membership benefit, closely followed by *Pacific Discovery* magazine. The members continue to strengthen the Academy's education, research, and exhibits through their loyal support.

**Associate Development Director**  
**Patricia Nicholson and Resources**  
**Coordinator Frances Reed**



## SPECIAL PROGRAMS AND TRAVEL

*Sandra Lelich*  
*Coordinator*

NUMEROUS FILMS, lectures, symposia and special events highlighted the past year. Special programs were planned to complement temporary exhibits. For example, participants enjoyed "Fitness America," a week-long series of lectures, workshops, and fitness testing offered during the Academy's summer Olympics photo show, "Shooting for the Gold." Also, lectures, a film series, and symposium were among the activities offered with the exhibit, "Circles of the World: Traditional Art of the Plains Indians."

For the holiday season, the Academy hosted its second annual "Christmas Trees Around the World" exhibit. This array of twelve trees, decorated by members of various ethnic communities in the Bay Area, graced the Cowell Hall entrance to the museum. Opening night festivities included the juggling antics of "High Street Circus," the German Youth Choir, piñatas and a special "Science In Action" with the Academy's own Santa. Over 1,200 members attended.

Programs covered a wide range of natural history topics. The annual Claire Matzger Lilienthal Distinguished lecture, "Travels of a Naturalist," was presented by author and television personality David Attenborough. Other presentations this year included "Dart, Taung and the Missing Link: 60 Years After," by Dr. Phillip V. Tobias; "Space Shots: Photographs of Worlds Beyond Our World," by author Timothy Ferris; a premiere of the film, "Island of the Bounty"; and a play entitled, "Conversations With A Tramp: An Evening With John Muir." The Academy also co-sponsored a program about the Farallon Islands with the Point Reyes Bird Observatory.

Simson African Hall was the site for a dinner and dance to raise funds for the Jane Goodall Institute and the California Academy of Sciences. This event celebrated twenty-five years of Jane Goodall's work with the chimpanzees of Tanzania.

The International Travel Program offered eleven expeditions to areas as diverse as Antarctica, the Galápagos Islands, and Papua New Guinea. Trips were led by Academy staff and other experts in the field. Among them, Dr. Robert T. Orr led a trip to Indonesia, Drs. George Lindsay and



James Kelley led a trip to Baja California, and museum trustee Lynn Dunne led a dive trip to the Sea of Cortez. More than 175 Academy members enjoyed these special travel opportunities.

A December cocktail party launched the Academy's new Penguin Club. The club's membership includes those adventurers who have taken two or more trips with the Academy. Benefits of membership include reduced fares on some trips, gift credits, and early notification of tours.

## SPECIAL EVENTS

*Deidre Kernan*  
*Coordinator*

THE SPECIAL EVENTS DEPARTMENT was organized within the Development Department in July of 1984. It has responsibility for organizing exhibit openings and museum events. The office is also responsible for renting the public spaces of the museum and aquarium to groups for parties and receptions after visiting hours. In its first year the department brought in over \$60,000 in rental fees. Groups who have used the facilities this year include PG&E;

Time, Inc.; Landels, Ripley & Diamond and Orrick, Herrington (San Francisco law firms); the San Francisco marathon; KQED; the OBGYN Convention; IBM; the U.S.S. Hector; National Geographic; the International Hospitality Center; the Bohemian Club; the Yuppie Cotillion, and the Garden Club of America.

The fiscal year 1984-85 was an active one. Museum events included opening-night receptions for Earth and Space Hall and for the exhibits "Circles of the World," "Birds in Art," and "Passage through India." Other events organized were the annual Friends' Dinner, the Curators' Circle Receptions, the Penguin Club party, the Fellows' Banquet, the Bio-Systematists' Dinner, the meeting of the Science Museum Directors, Fellows' Day, the MacArthur Distinguished Lecturer Series, the Claire Matzger Lilienthal Distinguished Lecturer reception, and Trustees' events.

Kim Dodd joined the department in April 1985 as Assistant to both Special Events and to Special Programs and Travel.



# CONTRIBUTIONS

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AS A NON-PROFIT private institution, the Academy depends on support from members of our community: business organizations, individuals, and public and private foundations. Gifts to the Academy are received in many forms: cash, securities, real and other property, and bequests. They may be given as unrestricted

funds to be used where the need is the greatest; to increase the Academy's endowment; or may be restricted to a mutually agreed special purpose. Donations are tax-deductible to the extent allowed by law.

## CORPORATIONS AND FOUNDATIONS

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The Winifred and Harry B. Allen Foundation  
American Express Company  
Atalanta/Sosnoff Capital Corporation  
M & D Balloons, Inc.  
Bank of California  
BankAmerica Foundation  
Banque Paribas  
Bechtel Power Corporation  
S. D. Bechtel, Jr. Foundation  
Belvedere Scientific Fund  
Stanley J. Bernhard & Associates  
John A. and Ruth C. Blume Foundation  
Robert and Alice Bridges Foundation  
California Casualty Insurance Group  
California and Hawaiian Sugar Company  
California Jockey Club Foundation  
California Vision Service Plan  
Chevron U.S.A. Inc.  
The Clorox Company Foundation  
Coldwell Banker  
Comdisco Financial Services Foundation  
Cooper Laboratories, Inc.  
Malcolm Cravens Foundation  
Crocker National Bank  
Crown Zellerbach Foundation  
Del Monte Corporation  
Di Giorgio Foundation  
Diamond Shamrock International Petrol Co.  
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Eastman Kodak Company  
Federal Home Loan Bank of San Francisco  
Federated Department Stores Foundation  
Fireman's Fund Insurance Company Foundation  
Foster Davis Foundation, Inc.  
The Gamble Foundation  
The Gap Stores  
Greylock Management Corp.

Evelyn and Walter Haas Jr. Fund  
William Randolph Hearst Foundation  
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 Pam Mullins, *AE*  
 Willa Mundell, *Do*  
 William Munich, *IG*  
 Katie Murphy, *Ad, SE*  
 Sharon Nadeau, *Aq*  
 Deborah Nebenzahl, *IG*  
 Dora Nelson, *ID*  
 Sylvia Newman, *DR*  
 Carland Nicholson, *Do*  
 Carmela Nilan, *DR*  
 Marion Norberg, *Do, OM*  
 Mary Frances Norman, *Do*  
 Shirim Nothenberg, *Aq*  
 Arthur Ober, *AE, DR, ID, Ad*  
 James O'Brien, *OM*  
 Larry Oliveria, *IG*  
 Toba Olson, *Do*  
 Margaret Orr, *Do*  
 Caroline Orrick, *IG*  
 Hayden O'Shea, *Aq*  
 James Osborne, *Ed*  
 Dorothy Oster, *Do*  
 Keith O'Toole, *Aq*  
 Rozell Overmire, *Do*  
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 Corey Raine, *En*  
 Doris Ramey, *PC*  
 Shannon Raugust, *Aq*  
 Sarah Recht, *IG*  
 Vicki Rega, *Ex*  
 Cecil Reichert, *PC*  
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 Terry Reilly, *IS*  
 Helen Renfro, *ID*  
 Elizabeth Rieger, *Do*  
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 Ruby Risser, *Do*  
 Janet Robbins, *Do*  
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 Orbelia Robinson, *Bo*  
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 Verna Rogers, *Do*  
 Sue Romig, *ID*  
 Henry Rosenthal, *DR*  
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 Sissy Rossi, *Do*  
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 Clyde Smith, *Do*  
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 Jeffrey Smith, *En*  
 Michael Smith, *En, Aq*  
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 Suzette Talbot, *Do*  
 Alice Tallent, *DR, SE*  
 William Tergis, *Do*  
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 Anna Thomson, *Do*  
 Sarah Tilton, *Bo*  
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 Mary Tomasco, *DR*  
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*Ad* Administration  
*AE* Academy Escort  
*Aq* Aquarium  
*Bo* Botany  
*Cu* Custodial  
*Do* Docent  
*DR* Discovery Room  
*Ed* Education  
*En* Entomology  
*Ex* Exhibits  
*He* Herpetology  
*Ic* Ichthyology  
*ID* Information Desk  
*IG* Invertebrates & Geology  
*IS* Instrument Shop  
*Li* Library  
*Ma* Mailroom  
*OM* Ornithology & Mammalogy  
*PC* Picture Collection  
*PD* Pacific Discovery  
*Ph* Photography  
*PI* Public Information  
*Pl* Planetarium  
*SE* Special Events

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 Phillip A. Summers, *Curatorial Assistant*  
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Peter Ward, *Research Associate*  
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Judith Wagner, *Research Associate*  
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Peter B. Allen, *Research Associate*  
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Chris Honeysett, *Cashier & Ticket Taker*  
Phillip Hong, *Cashier*  
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Sherrill Kohl, *Cashier & Ticket Taker*  
Kathleen Kolba, *Cashier & Ticket Taker*  
Carole Koppel, *Cashier*  
Maryann Lapuz, *Clerk & Ticket Taker*  
Linda Larrabee, *Cashier & Ticket Taker*  
Eric Louie, *Cashier & Ticket Taker*  
Sarah Mendelsohn, *Substitute Ticket Taker*  
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Shirim Nothenberg, *Ticket Taker*  
Anna Reisman, *Cashier*  
Bernadette Sallaberry, *Cashier & Weekend Floor Manager*  
Lucy Sallaberry, *Cashier & Ticket Taker*  
Eban Schletter, *Ticket Taker*  
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# FELLOWS OF THE CALIFORNIA ACADEMY OF SCIENCES

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THE FELLOWS of the California Academy of Sciences are an important part of the institution—the governing body of eminent scientists and trustees whose predecessors founded the institution 130 years ago. These individuals represent the full range of disciplines within the natural sciences and are appointed in recognition of their contributions to the growth of scientific knowledge, particularly in the Pacific region. Nominated by their colleagues and appointed by the Board of Trustees at the recommendation of the Science Council, the fellows remain members of the fellowship for life.

## FELLOWS' MEDALIST

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EACH YEAR, one or more prominent fellows is selected for special honors. At the annual fellows' meeting in October 1985, the institution's highest honor, the Fellows' Medal, was presented to University of California, Berkeley, Professor of Botany Lincoln Constance in recognition of his outstanding achievements in botanical research and for his active participation in advancing the work of the Academy.

## FELLOWS

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The following list includes the complete fellowship of the Academy. The fellows' fields of academic pursuit are given beside their names.

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# CALIFORNIA ACADEMY OF SCIENCES

## FINANCIAL STATEMENT

### STATEMENTS OF CURRENT FUNDS— General Operating Revenues, Expenses, Transfers and Fund Balance

*Years ended 30 June 1985 and 1984*

	1985	1984
<b>Revenues:</b>		
Admissions:		
General .....	\$1,548,326	\$1,619,759
Planetarium .....	184,765	181,487
Contributions:		
Corporate .....	83,769	71,253
Foundations .....	18,075	17,130
Individuals, trusts .....	200,000	211,193
Memberships .....	565,693	448,314
Concession Royalties:		
Restaurant .....	151,930	126,585
Museum store .....	82,826	78,074
Laser show (net) .....	47,101	24,990
Tuition and program fees:		
Junior Academy .....	15,720	11,301
Adult Education .....	114,014	106,383
International travel .....	50,000	50,000
City and County of San Francisco support of operations (note 8) .....	1,454,801	1,061,095
Institute of Museum Services Grant .....	50,000	50,000
Indirect cost reimbursement from grant contracts .....	104,229	120,516
Pacific Discovery and publications sales .....	18,757	14,630
Rental for special events .....	70,743	—
Miscellaneous income .....	73,706	50,039
<b>Total operating income</b> .....	<b>4,834,455</b>	<b>4,242,749</b>
Investment income:		
Commercial Building rent (net) .....	661,183	610,447
General Endowment Fund interest, dividends .....	394,101	328,635
<b>Total investment income</b> .....	<b>1,055,284</b>	<b>939,082</b>
<b>Total revenues</b> .....	<b>5,889,739</b>	<b>5,181,831</b>
<b>Investment income transfers from Special Purpose Fund</b> .....	<b>1,250,000</b>	<b>795,500</b>
<b>Total revenues and transfers</b> .....	<b>7,139,739</b>	<b>5,977,331</b>
<b>Expenses:</b>		
Administration .....	246,357	244,288
Research division .....	1,296,887	1,157,818
Public programs .....	1,097,414	919,403
Aquarium .....	1,032,133	945,581
Development and Membership .....	437,316	351,363
Support services and building operations .....	1,356,388	1,208,842
General and allocable costs .....	1,129,133	952,883
Capital expenditures .....	272,445	96,512
Employees' pension annuity (note 6) .....	102,567	97,954
Investment management fees .....	24,090	21,605
<b>Total expenses</b> .....	<b>6,994,730</b>	<b>5,996,249</b>
<b>Excess (deficiency) of revenues and investment income transfers over expenses</b> .....	<b>145,009</b>	<b>(18,918)</b>
<b>Fund balance (deficit) at beginning of year</b> .....	<b>(202,131)</b>	<b>(183,213)</b>
<b>Fund balance (deficit) at end of year</b> .....	<b>\$ (57,122)</b>	<b>(202,131)</b>

*See accompanying notes to financial statements.*



# STATEMENTS OF CHANGES IN FUND BALANCES

*Year Ended 30 June 1985*

	<i>Current funds</i>					<i>Total All Funds</i>	
	<i>General Operating Fund</i>	<i>Research Fund</i>	<i>Special Purpose Fund</i>	<i>General Endowment Fund</i>	<i>Museum Modernization Fund</i>	<i>1985</i>	<i>1984</i>
<b>Balances at beginning of year</b> . . . . .	\$ (202,131)	372,814	14,122,128	4,461,225	117,874	18,871,910	18,498,136
Additions:							
Contributions:							
Corporate . . . . .	83,769	100	112,532	15,000	3,500	214,901	92,473
Foundations . . . . .	18,075	26,000	100,238	10,000	400,000	554,313	437,890
Individuals, trusts . . . . .	200,000	25,533	637,272	954,599	775,026	2,592,430	658,251
Grant Income:							
Federal . . . . .	—	279,001	—	—	—	279,001	398,927
State . . . . .	—	119,242	—	—	—	119,242	10,000
Other . . . . .	50,000	27,400	15,000	—	—	92,400	80,500
Other operating income . . . . .	4,482,611	—	—	—	—	4,482,611	3,393,173
Investment income . . . . .	1,055,284	15,864	1,087,998	—	55,800	2,214,946	2,118,080
Net gain on sale of securities . . . . .	—	—	693,317	157,291	—	850,608	5,111
Tuition income . . . . .	—	—	164,421	—	—	164,421	87,994
Jane Goodall Institute Funds . . . . .	—	—	460,000	—	—	460,000	—
Rental income . . . . .	—	—	95,550	—	—	95,550	85,714
Other . . . . .	—	16,489	181,905	—	—	198,394	200,702
<b>Total additions</b> . . . . .	<b>5,889,739</b>	<b>509,629</b>	<b>3,548,233</b>	<b>1,136,890</b>	<b>1,234,326</b>	<b>12,318,817</b>	<b>8,068,815</b>
Deductions:							
Salary expense . . . . .	3,830,491	228,586	191,240	—	—	4,250,317	3,711,005
Other operating expenses . . . . .	2,968,054	171,038	—	—	—	3,139,092	2,604,084
Expenditures of research grants . . . . .	—	104,253	—	—	—	104,253	120,516
Amounts expended for furniture, fixtures and equipment (note 9) . . . . .	96,944	202,242	197,952	—	4,823	501,961	398,033
Amounts expended for construction (note 9) . .	—	10,000	30,495	—	—	40,495	47,378
Amounts expended for professional services . .	75,151	8,049	287,110	—	80,718	451,028	308,129
Amounts expended for investment management . . . . .	24,090	—	120,149	845	—	145,084	122,396
Amounts expended for exhibit installation . .	—	—	307,952	—	—	307,952	51,351
Amounts expended for materials and supplies .	—	—	238,926	—	—	238,926	177,721
Other . . . . .	—	—	254,241	—	54,813	309,054	154,428
<b>Total deductions</b> . . . . .	<b>6,994,730</b>	<b>724,168</b>	<b>1,628,065</b>	<b>845</b>	<b>140,354</b>	<b>9,488,162</b>	<b>7,695,041</b>
Transfers between funds . . . . .	1,250,000	—	(1,250,000)	—	—	—	—
<b>Balances at end of year</b> . . . . .	<b>\$ (57,122)</b>	<b>158,275</b>	<b>14,792,296</b>	<b>5,597,270</b>	<b>1,211,846</b>	<b>21,702,565</b>	<b>18,871,910</b>

*See accompanying notes to financial statements.*

## ACCOUNTANTS' REPORT

*The Board of Trustees  
California Academy of Sciences:*

We have examined the balance sheets of the funds of the California Academy of Sciences as of 30 June 1985 and the related statements of current funds—general operating revenues, expenses, transfers and fund balance for the years ended 30 June 1985 and 1984 and statements of changes in fund balances for the year ended 30 June 1985. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Under generally accepted accounting principles, expenditures for furniture, fixtures and equipment should be capitalized. The California Academy of Sciences charges such purchases to current expenses, the effect of which is more fully described in note 9.

In our opinion, except for the effect on the financial statements of the failure to capitalize expenditures for furniture, fixtures and equipment as discussed in the preceding paragraph, the aforementioned financial statements present fairly the financial position of the Califor-

nia Academy of Sciences at 30 June 1985, the results of its current funds operations for the years ended 30 June 1985 and 1984, and the changes in its fund balances for the year ended 30 June 1985, in conformity with generally accepted accounting principles applied on a consistent basis.

Our examinations were made for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplementary information included in Schedules 1 through 5 is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the examinations of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

*San Francisco, California  
30 August 1985*

*Peat, Marwick, Mitchell & Co.*

# BALANCE SHEETS

30 June 1985

ASSETS	Current funds					Total All Funds	
	General Operating Fund	Research Fund	Special Purpose Fund	General Endowment Fund	Museum Modernization Fund	1985	1984
<b>Cash:</b>							
Commercial accounts . . . . .	\$ 58,313	43,293	99,304	2,533	27,366	230,809	438,227
Savings accounts and money market funds . . .	—	—	1,559,924	101	1,054,534	2,614,559	623,177
<b>Receivables:</b>							
Research grants (note 2) . . . . .	—	623,826	—	—	—	623,826	485,588
Accrued interest and dividends receivable . . .	67,502	—	137,574	—	—	205,076	384,837
Other . . . . .	41,272	—	74,558	4,162	—	119,992	190,258
<b>Prepaid expenses</b> . . . . .	128,536	447	8,420	—	—	137,403	83,918
<b>Investments in marketable securities</b> (note 3) . . . . .	—	—	11,708,263	5,011,000	—	16,719,263	15,108,339
<b>Real property</b> (note 10) . . . . .	—	—	1,545,960	608,084	—	2,154,044	2,154,044
<b>Due from other funds</b> . . . . .	61,882	91,569	—	—	136,492	289,943	163,214
<b>Total assets</b> . . . . .	<b>\$357,505</b>	<b>759,135</b>	<b>15,134,003</b>	<b>5,625,880</b>	<b>1,218,392</b>	<b>23,094,915</b>	<b>19,631,602</b>
LIABILITIES AND FUND BALANCES							
<b>Liabilities:</b>							
Accounts payable . . . . .	347,495	1,462	78,058	—	6,546	433,561	361,752
Deferred grant income (note 11) . . . . .	—	599,398	—	—	—	599,398	158,965
Other liabilities . . . . .	67,132	—	2,316	—	—	69,448	75,761
Due to other funds . . . . .	—	—	261,333	28,610	—	289,943	163,214
	414,627	600,860	341,707	28,610	6,546	1,392,350	759,692
<b>Fund balances (deficit):</b>							
Current unrestricted, available for general operations . . . . .	(57,122)	—	—	—	—	(57,122)	(202,131)
Current restricted, designated by donors for:							
Research grants . . . . .	—	158,275	—	—	—	158,275	372,814
Special purpose . . . . .	—	—	14,792,296	—	—	14,792,296	14,122,128
Museum modernization . . . . .	—	—	—	—	1,211,846	1,211,846	117,874
Endowment fund, under board discretion . . . . .	—	—	—	5,597,270	—	5,597,270	4,461,225
Fund balances (deficit) . . . . .	(57,122)	158,275	14,792,296	5,597,270	1,211,846	21,702,565	18,871,910
Commitments and contingencies (note 12)							
<b>Total liabilities and fund balances</b> . . . . .	<b>\$357,505</b>	<b>759,135</b>	<b>15,134,003</b>	<b>5,625,880</b>	<b>1,218,392</b>	<b>23,094,915</b>	<b>19,631,602</b>

See accompanying notes to financial statements.

## NOTES TO FINANCIAL STATEMENTS

30 June 1985

### 1. Summary of Significant Accounting Policies

The California Academy of Sciences Natural History Museum and Aquarium (CAS) uses the accrual method of accounting with revenue recorded when earned and expenses recorded when incurred. Government grants are recognized in full when awarded if the term of the grant is one year or less. Grants applying to several years are deferred with the revenue recognized as related expenditures are incurred.

Gifts of specimens and collections are not included in the financial statements.

Donated materials and services are not recorded.

CAS has the following funds:

#### a. General Operating Fund:

This fund accounts for resources used in carrying on the routine operations of CAS in accordance with the limitations of its charter and bylaws. The Board of Trustees (Board) exercises discretionary control over this fund.

#### b. Restricted Funds:

1. The current Research Fund accounts for gifts and grants restricted to research projects. Certain of the current General Operating Fund expenditures are also for research.

2. The Special Purpose Fund accounts for resources contributed to CAS for specific purposes other than research projects. The resources are currently available for use, but expendable only for the purposes specified by the donors. Included are two major restricted funds, the William H. Noble fund and the Sinon Clare Lillis fund. Other accounts in this fund are designated for curatorial chairs, departmental endowment funds, special exhibitions and other special purposes. Income earned on these funds is generally available for the use of various CAS departments as designated by the Board of Trustees for operations. Expenditure of principal is also allowable if not specifically restricted by the donors, and it may be spent with Board action.

#### c. General Endowment Fund:

The General Endowment Fund is comprised of unrestricted gifts and bequests. Unrestricted gifts in excess of \$10,000 and life memberships in the amount of \$750 are credited to this fund. The principal amount of the gifts and bequests is not maintained intact in perpetuity. Transfers from the General Endowment Fund and dispositions of its principal are made at the discretion of the Board. The endowment investment income is credited, as earned, to the current General Operating Fund.



d. Museum Modernization Fund:

The Museum Modernization Fund is for resources contributed specifically for construction projects, plant additions, and the general capital renovation of the CAS facilities.

2. Research Grants Receivable

Grants receivable represent amounts pledged to CAS for certain operations and for the completion of designated projects in future years. The grants are collected when expenditures are made for the designated project. A summary of grants receivable follows:

National Endowment for the Arts .....	\$ 16,932
National Science Foundation .....	577,273
Other .....	29,621
	<u>\$623,826</u>

3. Investments—Marketable Securities

Securities are recorded at the lower of aggregate cost or market in accordance with generally accepted accounting principles. If acquired by gift, a security is recorded at the fair market value at the date of acquisition. At 30 June 1985, the book value and net unrealized gains pertaining to the marketable securities portfolios were as follows:

	<i>Book value</i>	<i>Market value</i>	<i>Net unrealized gain</i>
Special Purpose Fund:			
<i>Bonds and cash   equivalents</i> .....	\$ 4,012,497	4,184,629	172,132
<i>Stocks</i> .....	7,695,766	9,720,977	2,025,211
	<u>\$11,708,263</u>	<u>13,905,606</u>	<u>2,197,343</u>
General Endowment Fund:			
<i>Bonds and cash   equivalents</i> .....	2,216,339	2,479,770	263,431
<i>Stocks</i> .....	2,794,661	3,787,923	993,262
	<u>\$5,011,000</u>	<u>6,267,693</u>	<u>1,256,693</u>

4. Buildings

The buildings acquired by the CAS in Golden Gate Park are not reflected in the accompanying balance sheets since, under the terms of the Charter of the City and County of San Francisco (City), no one other than the City may hold title to buildings on City property. As the CAS facilities in Golden Gate Park are acquired, title is transferred to the City. The buildings were valued at \$22,800,000 by the latest insurance appraisal in 1982.

5. Collections, Library and Equipment

Collections, library and equipment are expensed in the year of acquisition and, as such, are not reflected in the accompanying balance sheets. CAS staff have estimated the replacement cost of collections, library, and equipment to be well in excess of \$20,000,000.

6. Employees' Pension Annuity

On 1 January 1964, CAS adopted a pension plan utilizing individual annuity contracts for all regular full-time staff members under the age of 59 as of that date. This plan has been amended to be in compliance with the Employee Retirement Income and Security Act of 1974, the Tax Equity and Fiscal Responsibility Act of 1982, the Deficit Reduction Act of 1984, and the Retirement Equity Act of 1985.

Under the provisions of the plan, CAS and its eligible employees each contribute an amount equal to five percent of the amount of salary subject to Social Security tax and seven and one half percent of the amount of salary above the Social Security tax base. Total pension expense was \$102,567 and \$97,954 for 1985 and 1984, respectively.

7. Trusts

CAS is the ultimate beneficiary under an irrevocable living trust in the amount of \$206,009 (market value \$283,555). The income of the trust is paid to the grantors and CAS bears the cost of all trust operations. The assets of the trust are not shown in the accompanying financial statements.

CAS is the trustee and beneficiary under four irrevocable unitrust agreements which, together, had a market value at 30 June 1985 of \$2,087,121. CAS is a fifty percent beneficiary under two of the agreements and is the sole beneficiary under the remaining two agreements. Each grantor receives an annual amount equal to a stated percentage of the net fair market value of the assets of the respective unitrust, except for one grantor who receives a stated

percentage of the net fair market value of the assets or current income, whichever is less. The percentages range from five to eight percent. These trusts absorb the costs of their operations. The assets of the trusts are not shown in the accompanying financial statements. Distributions to grantors under the unitrust agreements, for the fiscal year ended 30 June 1985, totaled \$118,122.

In 1983, CAS was named ultimate beneficiary of a Pooled Income Fund with a market value at 30 June 1985 of \$179,704. The assets of the fund are not shown in the accompanying financial statements.

8. Support from the City and County of San Francisco

Section 6.404d of the Charter of the City and County of San Francisco states that the City shall provide funds necessary for the maintenance of the Steinhart Aquarium and funds deemed proper for the maintenance of the Golden Gate Park buildings. During the fiscal years ended 30 June 1985 and 1984, CAS received \$1,454,801 and \$1,061,095 respectively, from the City and County of San Francisco for this support.

In addition to its annual support, in the fiscal year ended 30 June 1985, the City allocated \$2.0 million for the fiscal year ended 30 June 1986 to reroof the Golden Gate Park complex and to seismically upgrade the 1910 North American Hall. These construction projects may take up to two years to complete. These expenses and related support are not included in the financial statements as they do not represent annual on-going support from the City and County of San Francisco.

9. Furniture, Fixtures and Equipment

CAS departs from generally accepted accounting principles in that it expenses furniture, fixtures and equipment as acquired rather than capitalizing them and depreciating the costs over the useful lives thereof. During 1985 and 1984, CAS acquired furniture, fixtures and equipment costing \$501,961 and \$398,033, respectively. CAS also expended \$215,227 in 1985 and \$47,378 in 1984 for commercial building remodeling and other construction which was not capitalized.

10. Real Property

CAS owns an eleven-story, fully depreciated commercial building located in the City of San Francisco. The value as recorded on the balance sheet of the General Endowment Fund represents the cost of the land. The building was valued in excess of \$12,000,000 by an appraisal in December of 1982. In 1984, CAS signed two leases of 5 and 10 years with its major retail tenants.

In 1979 CAS received title to 3,117 acres of ranchland in Sonoma County known as Pepperwood Ranch Natural Preserve. CAS, under terms of the grant deed of title, must preserve the property in its current natural state and can utilize the property for research and educational activities for a period of at least ten years. The value as recorded on the balance sheet of the Special Purpose Fund represents the assessed value of the property on the date of the gift of \$808,460.

In 1981, CAS received a bequest of a fifty percent interest in a four-unit commercial building located in San Leandro, California. The other half interest is owned by the Society of California Pioneers. Fair market value of CAS's half of the property on the date of the gift was \$87,500 and is recorded in the Special Purpose Fund.

In 1982 CAS received a bequest recorded at \$664,157, which included a residence in San Francisco, California, valued at \$650,000, household furnishings and cash. The bequest was recorded in the Special Purpose Fund. The house is currently the Executive Director's residence.

11. Deferred Grant Income

During the year ended 30 June 1985, CAS performed an analysis of cumulative expenditures under its multiple year grants and determined expenditures had not yet been incurred for \$599,398 of available grants. In accordance with CAS policy, this amount has been deferred to future periods to be recognized as grant expenditures are incurred.

12. Commitments and Contingencies

CAS is involved in various claims and legal actions arising in the ordinary course of its operations. In the opinion of management, the ultimate disposition of all legal matters will not have a material adverse effect on CAS's financial condition.

13. Income Taxes

CAS is qualified as a tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code and is not a private foundation. CAS is also a public-benefit tax-exempt corporation under the laws of the State of California.

14. Total Columns

Total columns on the balance sheets and statements of changes in fund balances are presented to aggregate financial data. Data in these columns do not present financial position, results of operations, or changes in financial position in conformity with generally accepted accounting principles. Neither is such data comparable to a consolidation. Interfund eliminations have not been made in the aggregation of this data.

# SCHEDULE OF SPECIAL PURPOSE FUNDS

*30 June 1985*

The following accounts, which constitute the Special Purpose Fund, were created by donors who gave gifts to CAS restricted to support special programs, projects, and exhibits:

	<i>Fund Balance</i>
<b>For Research Activities:</b>	
Anthropology Department	
<i>Irvine Foundation Anthropology Chair</i> . . . . .	\$ 825,341
<i>Reitz Food Technology Foundation Fund</i> . . . . .	48,980
<i>Elkus Collection Fund</i> . . . . .	22,369
<i>Gifts—Anthropology</i> . . . . .	6,815
Botany Department	
<i>Decker &amp; Martha McAllister Botany Chair</i> . . . . .	157,787
<i>Botany Endowment Fund</i> . . . . .	139,066
<i>John T. Howell Botany Chair (partial)</i> . . . . .	136,226
<i>Hiram Bloomer Memorial Fund</i> . . . . .	33,857
<i>Friedman Costa Rica Account</i> . . . . .	5,297
<i>Gifts—Botany</i> . . . . .	15,570
Entomology Department	
<i>Dr. Harriet Exline Frizzell Fund for Arachnid Research</i> . . . . .	148,286
<i>Owen Bryant Memorial Fund</i> . . . . .	40,287
<i>Edwin Cooper Van Dyke Fund</i> . . . . .	38,915
<i>Entomology Endowment</i> . . . . .	2,898
Herpetology Department	
<i>Gifts—Herpetology</i> . . . . .	25,872
Ichthyology Department	
<i>Gifts—Ichthyology</i> . . . . .	23,701
Invertebrate Zoology and Geology Department	
<i>Magnus Vonsen Mineral Fund</i> . . . . .	38,241
<i>Rollie and May Ada Henley Fund</i> . . . . .	28,301
<i>MacArthur Foundation Grant (Michael Ghiselin)</i> . . . . .	20,050
<i>Compactor Installation (NSF Match)</i> . . . . .	19,044
<i>G. Dallas Hanna Memorial Fund</i> . . . . .	11,882
<i>Gifts—Invertebrate Zoology and Geology</i> . . . . .	10,229
<i>Gifts—Mineralogy</i> . . . . .	3,537
<i>Gifts—Malacology</i> . . . . .	1,549
Ornithology and Mammalogy Department	
<i>Augsbury Fund</i> . . . . .	11,625
<i>Gifts—Ornithology and Mammalogy</i> . . . . .	16,472
Library Department	
<i>Library Duplicate Book Sales</i> . . . . .	36,236
<i>Gifts—Library</i> . . . . .	23,737
Picture Collections Department	
<i>Gifts—Picture Collections</i> . . . . .	25,437
Scientific Publications Department	
<i>Gifts—Publications</i> . . . . .	138,409
G. Lindsay Scholarship Fund for Field Research . . . . .	108,777
Tilton Post-Doctorate Fellowship Fund . . . . .	23,731
	<u>2,188,524</u>

	<i>Fund Balance</i>
<b>For Public Program Activities:</b>	
Planetarium Department	
<i>Charles Goethe Planetarium Fund</i> . . . . .	121,594
<i>Planetarium Remodeling Fund</i> . . . . .	47,285
<i>B. D. Dean Memorial Fund</i> . . . . .	38,228
<i>Pendulum Revolving Fund</i> . . . . .	(1,854)
Exhibits Department	
<i>Life Through Time Hall</i> . . . . .	125,321
<i>Wattis Hall Fund</i> . . . . .	48,718
<i>Barrett Hindes Memorial Fund</i> . . . . .	12,945
<i>Earth and Space Science Hall Renovation</i> . . . . .	3,462
<i>Stephens Horological Fund</i> . . . . .	1,609
<i>Gifts—Exhibits</i> . . . . .	6,152
Education Department	
<i>Charles M. Goethe Endowment Fund for the Junior Academy</i> . . . . .	608,354
<i>Claire M. Lilienthal Memorial Lecture Series</i> . . . . .	64,122
<i>Thomas and Marion Tilton Fund</i> . . . . .	23,878
<i>Science in Action Radio Program</i> . . . . .	17,433
<i>Discovery Room</i> . . . . .	11,574
<i>Rainforest Symposium</i> . . . . .	11,003
<i>International Travel Fund</i> . . . . .	7,479
<i>Traditional Arts Program</i> . . . . .	6,480
<i>Docents Funds</i> . . . . .	2,257
<i>Symposia Revolving Fund</i> . . . . .	(1,607)
<i>Gifts—Junior Academy</i> . . . . .	34,343
	<u>1,188,776</u>
<b>For Aquarium Activities:</b>	
<i>Aquatic Biology Fund</i> . . . . .	68,215
<i>Dolphin Tank Renovation Fund</i> . . . . .	21,538
	<u>89,753</u>
<b>For Other Academy Activities:</b>	
<i>William H. Noble Bequest</i> . . . . .	5,790,528
<i>Sinon Clare Lillis Fund</i> . . . . .	3,196,796
<i>Pepperwood Ranch Operating Fund</i> . . . . .	859,507
<i>Frances Hanan Bequest</i> . . . . .	663,451
<i>Jane Goodall Institute Accounts</i> . . . . .	497,881
<i>Donald Patterson Bequest</i> . . . . .	83,538
<i>Geraldine K. Lindsay Memorial Fund</i> . . . . .	72,890
<i>Pepperwood Endowment Fund</i> . . . . .	60,304
<i>Allen D. Christensen Fund</i> . . . . .	26,305
<i>Pepperwood Master Plan Fund</i> . . . . .	15,956
<i>Kathryn C. Kendrick Memorial Fund</i> . . . . .	15,650
<i>William Hewlett Fund</i> . . . . .	11,760
<i>Membership Campaign Revolving Fund</i> . . . . .	9,739
<i>Wilson and Mabel Meyer Memorial Fund</i> . . . . .	8,348
<i>Morrison Auditorium Refurbishing Fund</i> . . . . .	7,238
<i>Fellows Research Fund</i> . . . . .	4,227
<i>Great Barrier Reef Book Revolving Fund</i> . . . . .	(2,795)
	<u>11,321,323</u>
All other under \$1,000 . . . . .	3,920
<b>Total</b> . . . . .	<u><u>\$14,792,296</u></u>



## SCHEDULE OF EXPENDITURES FOR THE RESEARCH DIVISION

*Year ended 30 June 1985  
with comparative figures for 1984*

Research and curatorial expenditures:

<i>Department</i>	<i>General Operating Fund</i>	
	<i>1985</i>	<i>1984</i>
Anthropology .....	\$ 89,822	50,321
Botany .....	179,771	177,842
Entomology .....	221,031	191,939
Herpetology .....	101,077	89,362
Ichthyology .....	132,256	118,619
Invertebrate Zoology & Geology .....	244,412	210,176
Ornithology & Mammalogy .....	93,827	87,663
Library .....	164,382	148,680
Picture Collection .....	27,316	25,903
Publications .....	20,258	35,670
Other research .....	22,735	21,643
	<u>\$1,296,887</u>	<u>1,157,818</u>

## SCHEDULE OF EXPENDITURES FOR SUPPORT SERVICES AND BUILDING OPERATIONS

*Year ended 30 June 1985  
with comparative figures for 1984*

	<i>General Operating Fund</i>	
	<i>1985</i>	<i>1984</i>
Admissions .....	\$ 83,924	76,491
Business office .....	224,691	211,162
Instrument shop .....	109,233	172,032
Security .....	216,177	214,926
Janitorial .....	253,130	222,680
Public Information .....	130,406	154,936
Pacific Discovery .....	205,239	156,615
Personnel .....	41,671	—
Building operations .....	91,917	—
	<u>\$ 1,356,388</u>	<u>1,208,842</u>

## SCHEDULE OF EXPENDITURES FOR THE PUBLIC PROGRAMS DIVISION

*Year ended 30 June 1985  
with comparative figures for 1984*

	<i>General Operating Fund</i>	
	<i>1985</i>	<i>1984</i>
Public programs administration .....	\$ 80,501	76,373
Planetarium .....	212,492	215,797
Exhibits .....	433,326	318,244
Photography .....	52,923	35,394
Education/Junior Academy .....	92,336	94,910
Adult education .....	109,776	69,180
Volunteer services .....	42,626	39,995
Cabinet shop .....	73,434	69,510
	<u>\$1,097,414</u>	<u>919,403</u>

## SCHEDULE OF GENERAL AND ALLOCABLE COSTS

*Year ended 30 June 1985  
with comparative figures for 1984*

	<i>General Operating Fund</i>	
	<i>1985</i>	<i>1984</i>
Insurance .....	\$ 338,173	267,611
Telephone .....	52,960	47,787
Utilities .....	193,261	178,320
Postage .....	53,813	46,121
Professional services .....	75,151	68,055
Employer taxes .....	279,538	245,640
Annual report .....	18,551	18,504
Entertainment .....	9,562	11,173
Employee recreation .....	13,230	1,431
Computer support .....	24,870	17,648
Automobile gas and maintenance .....	14,993	18,640
Miscellaneous .....	55,031	31,953
	<u>\$ 1,129,133</u>	<u>952,883</u>

# SCHEDULE OF MULTIPLE YEAR RESEARCH GRANTS

30 June 1985

	<i>Cumulative Grant Award</i>	<i>Prior Years Grant Expenditures</i>	<i>Current Year Grant Expenditures</i>	<i>Deferred Grant Income</i>
<b>National Science Foundation:</b>				
Anthropology Department				
<i>Correlates of Formal Design Structure</i> . . . . .	\$ 24,862	23,381	1,481	—
Botany Department				
<i>Support for Care and Use of the Systematic Collections of Botany</i> . . . . .	228,900	69,935	61,940	97,025
<i>U.S. China Cooperative Research</i> . . . . .	48,206	—	20,014	28,192
Entomology Department				
<i>Acquisition of a Scanning Electron Microscope and Accessories</i> . . . . .	81,219	81,219	—	—
<i>Support for the Systematic Collections of Entomology</i> . . . . .	355,000	273,979	73,413	7,608
Herpetology Department				
<i>Support for the Systematic Collections of Herpetology</i> . . . . .	274,213	226,459	47,754	—
Ichthyology Department				
<i>Support for the Collection of Fishes</i> . . . . .	300,945	229,058	62,818	9,069
<i>Relationships and Biogeography of Phallostethid Fishes</i> . . . . .	35,000	16,055	18,945	—
<i>Nominal Genera and Species of Fishes</i> . . . . .	42,450	—	11,635	30,815
Invertebrate Zoology Department				
<i>Support for a Major Systematic Collection of Recent Mollusks</i> . . . . .	150,000	77,142	41,250	31,608
<i>Compacterization of the Biological Research Collections</i> . . . . .	355,000	—	159,239	195,761
Ornithology and Mammalogy Department				
<i>Computerization of a Major Ornithology Collection</i> . . . . .	199,255	—	13,615	185,640
<b>Total National Science Foundation</b> . . . . .	2,095,050	997,228	512,104	585,718
<b>National Oceanic and Atmospheric Administration:</b>				
Ichthyology Department				
<i>Alaska Voucher-Specimen Project</i> . . . . .	11,604	—	11,604	—
<b>National Endowment for Arts:</b>				
Anthropology Department				
<i>Coptic Textiles Catalog</i> . . . . .	25,000	11,320	—	13,680
<b>Smithsonian Institution:</b>				
Ichthyology Department				
<i>Study of Zoarcidae Fish Family</i> . . . . .	11,639	—	11,639	—
<b>CalCOFI:</b>				
California Cooperative Oceanic Fisheries Investigation administered for				
<i>Scripps Institution, Cal Fish and Game and National Marine Fisheries Service</i> . . . . .	30,000	—	30,000	—
<b>Corps of Engineers:</b>				
Invertebrate/Zoology				
<i>Paleontological Survey for Cottonwood Creek Project</i> . . . . .	117,576	67,628	49,948	—
<b>San Francisco Foundation:</b>				
Public Programs Department				
<i>Planning Grant for Life Through Time Exhibit</i> . . . . .	27,400	—	27,400	—
<b>Total Multiple Year Research Grants</b> . . . . .	\$2,318,269	1,076,176	642,695	599,398

A portion of the museum's general operating funds for this fiscal year has been provided through a grant from the Institute of Museum Services, a federal agency that offers general operating support to the nation's museums.



SCHEDULE OF COMPARATIVE FIVE-YEAR DATA  
GENERAL OPERATING FUND

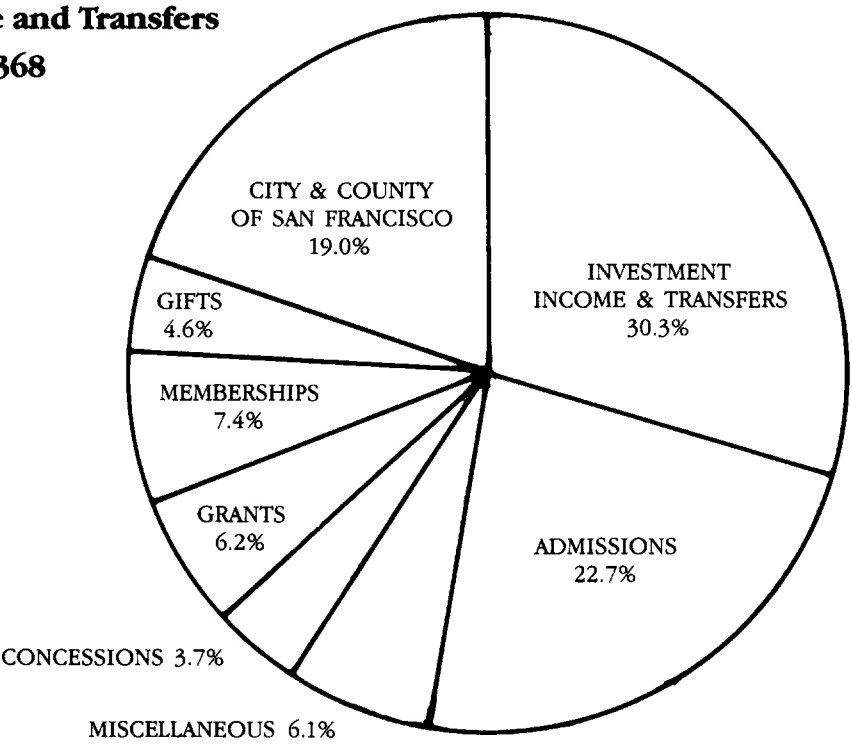
(in thousands)

	Year ended 30 June				
	1985	1984	1983	1982	1981
<b>Revenues:</b>					
Admissions	\$ 1,733	1,801	1,627	1,178	826
Memberships	566	448	436	307	226
City and County of San Francisco	1,455	1,061	963	886	947
Other	1,080	933	788	1,037	907
Total operating income	4,834	4,243	3,814	3,408	2,906
<b>Investment income:</b>					
Commercial Building rent (net)	661	610	523	445	377
General Endowment Fund interest, dividends	394	329	309	299	242
	1,055	939	832	744	619
<b>Investment income transfers from Special Purpose Fund</b>	1,250	795	704	290	614
<b>Total revenues and transfers</b>	7,139	5,977	5,350	4,442	4,139
<b>Expenses:</b>					
Administration and general	3,568	2,973	2,716	1,950	1,570
Research	1,296	1,158	1,123	916	814
Public Programs and Aquarium	2,130	1,865	1,617	1,653	1,615
<b>Total expenses</b>	6,994	5,996	5,456	4,519	3,999
<b>Excess of expenses over revenues and investment income transfers</b>	145	(19)	(106)	(77)	140
<b>Fund balance (deficit) at beginning of year</b>	(202)	(183)	(77)	—	(140)
<b>Fund balance (deficit) at end of year</b>	\$ (57)	(202)	(183)	(77)	—
<b>Investment portfolio comparisons:</b>					
Endowment:					
Book value of securities	\$ 5,011	3,775	3,702	3,514	3,334
Market value of securities	6,268	4,061	4,592	3,229	3,444
Special purpose:					
Book value of securities	11,708	11,334	9,746	9,914	8,886
Market value of securities	13,906	11,690	11,381	9,721	9,250
<b>Total market value of securities</b>	\$20,174	15,751	15,973	12,950	12,694

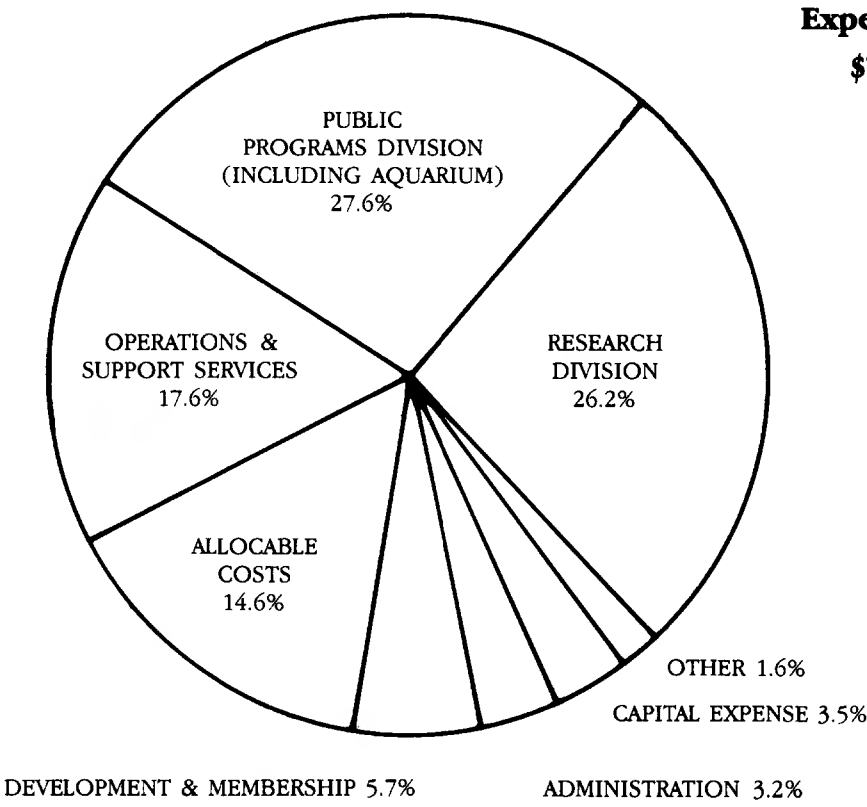
CURRENT FUNDS

for year ended 30 June 1985

Income and Transfers  
\$7,649,368



Expenditures  
\$7,718,898



# STAFF PUBLICATIONS

- ALMEDA, FRANK 1984. New and noteworthy additions to the Melastomataceae of Panama. *Proceedings of the California Academy of Sciences* 43(17):269–282.
- BAPTISTA, LUIS F. 1984. El Niño and a brumal breeding record for an insular Savannah Sparrow. *Wilson Bulletin* 96:302–303.
- . 1984. Vocal “dialects” in Nuttall’s White-crowned Sparrow. *Current Ornithology* 2:103–133. (With D. E. Kroodsma, M. Charles Baker, and Lewis Petrinovich.)
- . 1984. Song dialects, mate selection and breeding success in White-crowned Sparrows. *Animal Behavior* 32:1078–1088. (With Lewis Petrinovich.)
- . 1985. Photoperiodically induced ovarian growth in the White-crowned Sparrow (*Zonotrichia leucophrys gambelii*) and its augmentation by song. *Comparative Biochemistry and Physiology* 80A:93–97. (With M. L. Morton and M. E. Pereyra.)
- BARTHOLOMEW, B. 1984. *Camellias*. Timber Press, Portland. (With H. T. Chang.)
- CARROLL, D. L. 1985. Dating the Foot-powered Loom: the Coptic Evidence. *American Journal of Archaeology* 89:168–173.
- CHESTERMAN, C. W. 1984. Cenozoic stratigraphy of Shasta Valley, Siskiyou, California: California Division of Mines and Geology. *California Geology* 37(4):67–74. (With G. J. Saucedo.)
- DEMOUTHE, J. F. 1985. Type localities in Nevada. *Mineralogical Record* 16:43–56.
- DINGUS, L. 1984. Effects of stratigraphic completeness on interpretations of extinction rates across the Cretaceous-Tertiary boundary. *Palaeobiology* 10(4):420–438.
- DREWES, R. C. 1984. Evaporative water loss and skin lipids of anuran amphibians. *Journal of Experimental Zoology* 233:11–17. (With P. C. Withers and S. S. Hillman.)
- . 1985. A case of paraphyly in the genus *Kassina* Girard, 1853 (Anura: Herpeliidae). *South African Journal of Science* 81(4):186–191.
- . 1985. Mating calls of the ‘Kassinoid’ genera *Kassina*, *Kassinula*, *Phlyctimantis*, and *Tornierella* (Anura: Hyperoliidae). *South African Journal of Science* 81(4):191–195. (With M. Tandy.)
- . 1985. Specific status of the East African colubrid snake, *Psammophis tanganicus*. *Journal of Herpetology* 19(2):246–253. (With R. Bezy.)
- FAUTIN, D. G. 1985. Sea anemones that harbor symbiotic pomacentrid fishes in the western Pacific. *National Geographic Society Research Reports*.
- . 1985. Catalog of non-asteroid, non-mollusk type-specimens in the Department of Invertebrate Zoology, California Academy of Sciences. *Occasional Papers of the California Academy of Sciences* 144:1–21. (With B. Weitbrecht.)
- GHISELIN, M. T. 1984. *Peripatus* as a Living Fossil. Pp. 214–217 in *Living Fossils*, N. Eldredge and S. M. Stanley, eds.
- . 1984. (See Terrence Gosliner.)
- GOSLINER, T. M. 1984. Parallel evolution in opisthobranch gastropods and its implications for phylogenetic methodology. *Systematic Zoology* 33(3):255–274. (With M. Ghiselin.)
- . 1984. *Tritonia pickensi* (Nudibranchia: Tritoniidae) from Baja California, Mexico. *Shells and Sea Life* 16(9):138–139. (With Hans Bertsch.)
- . 1984. Two new species of *Gastropoda* (Gastropoda: Opisthobranchia) from southern Africa. *Publications of the Seto Marine Biological Laboratory* 29(4/6):231–247.
- . 1985. Records and morphology of *Lomanotus stauberi* Clark and Goetzfried, 1976, from the Panamic Pacific. *The Veliger* 27(4):397–405. (With Hans Bertsch.)
- . 1985. The aeolid nudibranch family Aeolidiidae (Gastropoda: Opisthobranchia) from tropical southern Africa. *Annals of the South African Museum* 95(6):233–267.
- HAMMOND, N. 1984. Two Roads Diverged: A Brief Comment on “Lowland Maya Archaeology at the Crossroads.” *American Antiquity* 49:821–826.
- . 1984. Trace Element Analysis of Obsidian Artifacts from a Classic Maya Residential Group at Nohmul, Belize. *American Antiquity* 49:815–820. (With M. Neivens and G. Harbottle.)
- . 1984. “Belize” in *Current Research: Mesoamerica*. *American Antiquity* 49:869–870.
- . 1984. Nineteenth Century Drawings of Maya Monuments in the Society’s Library. *Antiquaries Journal [Society of Antiquaries of London]* 64:84–103.
- . 1984. Reply to J. Damp. *Journal of Field Archaeology* 11:428–429. (With K. Bruhns.)
- . 1985. A Seventeenth Century View of the Antiquities Trade. *Journal of Field Archaeology* 12:107.
- . 1985. Nohmul: A Prehistoric Maya Community in Belize. *British Archaeological Reports* 250 (2 volumes).
- HOBAN, M. A. 1985. Cretaceous diatoms of the Canadian Arctic. *Journal of Phycology (Supplement)* 21:22.
- IWAMOTO, T. 1984. Macrouridae. Western Indian Ocean, Vol. IV in *FAO Species Identification Sheets for Fishery Purposes*. W. Fischer and G. Bianchi, eds. Food and Agriculture Organization of the United Nations, Rome.
- KAVANAUGH, D. H. 1984. a catalog of the Coleoptera of America north of Mexico. Family Amphizoidae. United States Department of Agriculture, Agriculture Handbook No. 529–5, x + 5 pp.
- . 1984. Studies on the Nebriini (Coleoptera: Carabidae), V. New Nearctic *Nebria* taxa and changes in nomenclature. *Proceedings of the California Academy of Sciences* 43:159–177.
- . 1985. *Trechus obtusus* Erichson (Coleoptera: Carabidae), a European ground beetle, on the Pacific Coast of North America: its distribution, introduction, and spread. *The Pan Pacific Entomologist* 61:170–179. (With T. L. Erwin.)
- LANDRUM, L. 1984. The taxonomic implications of the discovery of calyptate species of *Myrceugenia* (Myrtaceae). *Brittonia* 36(2):161–166.
- . 1984. A new name and new combinations in *Campomanesia* and *Pimenta* (Myrtaceae). *Brittonia* 36(3):241–243.
- . 1984. Proposal to conserve 5565 *Blepharocalyx* against *Heteromyrtus* (Myrtaceae). *Taxon* 33:521–522.
- LEE, W. L. 1985. Carotenoid patterns in 29 species of sponges in the order Poecilosclerida (Porifera: Demospongiae): a possible tool for chemosystematics. *Marine Biology* 86:21–35.
- . 1985. Joucher specimens and the management of Pacific basin systematics collections. *Forum on Systematics Resources in the Pacific*. Bernice Pauahi Bishop Special Publication 74, Bishop Museum Press. (Ed. S. H. Sohmer.)
- LEVITON, A. E. 1984. Description of a new species of *Cyrtodactylus* from Afghanistan with remarks on the status of *Gymnodactylus longipes* and *Cyrtodactylus fedtschenkoi*. *Journal of Herpetology* 18:270–276. (With S. C. Anderson.)
- . 1985. John Anderson (1833–1900): A Zoologist in the Victorian Period; Including an up-to-date checklist and bibliography to the herpetofauna of the Arabian Peninsula. Chapter 1 in *The Herpetology of Arabia*, by John Anderson, K. Adler, ed. (Reprint edition.) (With Michele L. Aldrich.)



- McCOSKER, J. E. 1984. Attacks on divers by white sharks in Chile. California Department of Fish and Game 70:173–179. (With A. C. Egaña.)
- . 1984. Predatory behavior of the white shark (*Carcharodon carcharias*), with notes on its biology. Proceedings of the California Academy of Sciences 43:221–238. (With T. C. Tricas.)
- . 1984. Three new species of western Atlantic snake eels (Pisces: Ophichthidae) of the genus *Ophichthus*. Proceedings of the Academy of Natural Sciences of Philadelphia 136:24–31. (With E. B. Böhlke.)
- . 1984. A review of the snake eel genera *Gordichthys* and *Ethadophis*, with descriptions of new species and comments on related Atlantic bascanichthyins (Pisces: Ophichthidae). Proceedings of the Academy of Natural Sciences of Philadelphia 136:32–44. (With J. E. Böhlke.)
- . 1984. Japanese moray eels of the genus *Uropterygius*. Japanese Journal of Ichthyology 31:261–267. (With K. Hatooka, K. Sasaki, and J. T. Moyer.)
- . 1985. Temperature, heat production and heat exchange in lamnid sharks. Memoirs of the Southern California Academy of Sciences 9:92–108. (With F. G. Carey, J. G. Casey, H. L. Pratt, and D. Urquhart.)
- . 1985. White shark attack behavior: observations of and speculations about predator and prey strategies. Memoirs of the southern California Academy of Sciences 9:123–135.
- PARENTI, L. R. 1984. Biogeography of the Andean Killifish genus *Orestias*, with comments on the species flock concept. pp. 85–92, in *Evolution of fish species flocks*, A. A. Echelle and I. Kornfield, eds. University of Maine Press.
- . 1984. Killifish classification. *Aquarist*, 1984: 20–22.
- PENNY, N. D. 1985. Neuroptera of the Amazon Basin—Part 8. Berothidae. *Acta Amazonica* 13(3/4):689–695.
- . 1985. Neuroptera of the Amazon Basin—Part 9. Albardiinae. *Acta Amazonica* 13(3/4):697–699.
- . 1985. A new species of *Issikiella* from the Amazon Basin (Mecoptera: Bittacidae). *Acta Amazonica* 13(3/4):701–704. (With J. R. Arias.)
- . 1985. Mantispideos do Brasil (Neuroptera: Mantispidae). *Acta Amazonica* 13(3/4):601–687. (With C. A. da Costa.)
- PHILIP, C. B. 1984. Comments on the presumed Holarctic occurrence of the horse fly *Hybomitra nitidifrons* (Diptera: Tabanidae). *International Journal of Entomology* 26:286–288. (With R. S. Lane.)
- . 1984. *Lanellus*, a new subgenus of primitive, California “horse flies” (Diptera, Tabanidae). *The Pan-Pacific Entomologist* 60:265–266.
- POSS, S. G. 1984. Aploactinidae, Congiopodidae, Dactylopteridae. Western Indian Ocean, Vol. I, II in *FAO species Identification Sheets for Fishery Purposes*, W. Fischer and G. Bianchi, eds. Food and Agriculture Organization of the United Nations, Rome.
- . 1984. Scorpaenidae. Western Indian Ocean, Vol. IV in *FAO Species Identification Sheets for Fishery Purposes*, W. Fischer and G. Bianchi, eds. Food and Agriculture Organization of the United Nations, Rome. (With K. V. Rama Rao.)
- PULAWSKI, W. J. 1985. *Harpactus* Shuckard, 1837, the valid name for the genus currently called *Dienoplus* Fox, 1894 (Hymenoptera: Sphecidae). *Systematic Entomology* 10:59–63.
- ROSS, E. S. 1984. Take a closer look (A series of six color photographs with text devoted to principles of camouflage). Janssen Pharmaceutica, Inc. 12 pp.
- . 1985. Order Embiidina (Embiopoda). *Insects of Southern Africa*. Chapter 10, pp. 71–73. Edited by C. H. Scholtz and E. Holm.
- SCHONEWALD, J. 1985. Cranial morphometry of Pacific Coast Elk (*Cervus elaphus*). *Journal of Mammalogy* 66:63–74. (With C. M. Schonewald-Cox and J. W. Bayless.)
- TRAIL, P. W. 1985. Territoriality and dominance in the Lek-breeding Guianan Cock-of-the-Rock. *National Geographic Research*, Winter 1985:112–123.
- . 1985. Courtship disruption modifies mate choice in a Lek-breeding bird. *Science* 227:778–780.
- WEISSMAN, D. B. 1984. Five new species of the band-winged grasshopper genus *Trimerotropis* Stal (Orthoptera: Oedipodinae). *The Pan-Pacific Entomologist* 60:227–237. (With D. C. F. Rentz.)
- . 1984. Notes on the autecology, cytology, morphology, and crepitation of *Trimerotropis* grasshoppers (Orthoptera: Oedipodinae). *The Pan-Pacific Entomologist* 60:269–278.
- WEITBRECHT, B. 1985. (See Daphne Fautin.)

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